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A Study in Dynamic Symmetry

By Albert A. Southwick

Whether the object of their wonder be the solstices or the incommensurability of the diagonal of a square with the side; for it seems wonderful to all men that there is a thing which cannot be measured even by the smallest unit.—*Aristotle, Metaphysica, B.* I, *C. ii.*

TO the generally practised method of determining design space by dividing the contour in units of linear measure, three practical systems have recently been added—one of which may be said to be divisible into two.

Mr. Jay Hambidge through his discovery of new methods for the application of elementary geometry has made it possible to combine forms with an accuracy equal to any which we have known, and with far greater variety and interest. Furthermore, one of these systems has been shown to be closely related to laws which control part, and possibly all, of organic growth in nature. It also corresponds with the proportions of many examples of the best Greek work with a persistent exactitude which it is difficult to believe can be due to simple coincidence.

The three systems mentioned are based upon the use of rectangles, and related rectangular parallelopipeds, whose proportions are such that they are peculiarly adapted for the measurement of space, and whose employment gives results that seem to be of a higher order than it has been possible to attain with the monotonous repetition of a single form, which has so long been the basis of all calculated design.

Of the three rectangles, Fig. 1 shows that whose width is to its length as one is to the square root of two. Because of this it has been called the root-two rectangle. Its dimensions are derived directly from the square by means of its diagonal, and the square (*A*) on the side has twice the area of the square (*B*) on the end.

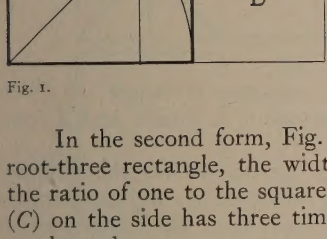


Fig. 1.

The related squares and rectangles form a complete and perfectly co-ordinated system, which, without being the most useful, is none the less entirely workable, and is a very valuable addition to our means of dividing areas for the purposes of design.

In the second form, Fig. 2, which has been called the root-three rectangle, the width is related to the length in the ratio of one to the square root of three, and the square (*C*) on the side has three times the area of the square (*D*) on the end.

Some very fine work has been done with this rectangle, but it subdivides in a rather complicated way, and there is reason to doubt that squares and root three rectangles, although constituting a perfect system, will ever be used for other than relatively simple forms.

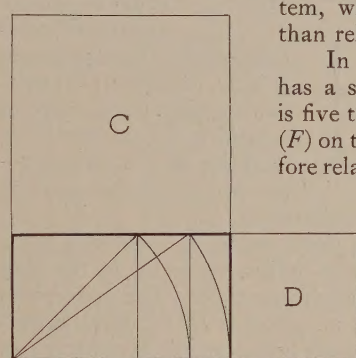


Fig. 2.

In Fig. 3 the rectangle shown has a square (*E*) on the side that is five times the area of the square (*F*) on the end. Its width is therefore related to its length in the ratio of one to the square root of five. As is indicated by the dotted line, the root-five rectangle can be divided into two rectangles (*G*) and (*H*) of the same shape, either of which is the reciprocal of the other. Furthermore, the widths of these two rectangles are related to the lengths in the ratio of extreme and mean proportion. So nearly as whole numbers can do it this proportion is expressed in the summation series 1, 2, 3, 5, 8, 13, 21, 34, 89, 144, 233, etc. It is the famous golden section, *sectio divina*, etc., which has been much discussed, but whose usefulness when related to area has been very incompletely comprehended. This rectangle is formed in solving either the eleventh proposition of the second book or the thirtieth of the sixth book of Euclid's "Elements."

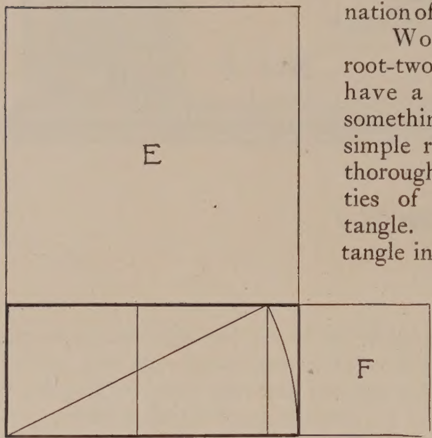
The root-five rectangle is the one that is related to organic forms in nature. Perhaps the most convenient verification of this is in the common daisy, which normally has twenty-one rows of fleurettes radiating from the centre in one direction and thirty-four in the other.

It is probable that one to the square root of five, with its related ratios, will be the basis of practically all work in form for the future, as it seemingly has been for the best proportioned that has been done in the past.

Any one of the three rectangles can be used with related squares to form a scheme of co-ordinated parts, but no way has been found to employ them with one another. It having been decided, for instance, to relate the parts of a plan by means of squares and root-two rectangles, that scheme must be adhered to throughout, as neither root-threes nor root-fives can be made to fit into the forms resulting from the use of root-twos.

No extreme and mean rectangle, it seems, can ever appear in the subdivisions or natural increase of either root-

two or root-three rectangles, but it is always present in forms whose parts have been brought into relationship by the use of root-fives. Thus, in any one of the three systems harmonious relation of the parts is achieved not only directly but also indirectly by the elimination of all unrelated forms.



Work based on the root-two rectangle seems to have a character that is something between static, simple repetition, and the thoroughly dynamic qualities of the root-five rectangle. The root-two rectangle in length is equal to the length of the diagonal of the square in its end (Fig. 1). The length of a root-five rectangle is equal to the diagonal of the rectangle formed by two squares (Fig. 3). Evidently the root-two is a more elemental form —lacking the extraordinary qualities of the root-five— but perhaps on that account more easily explained and understood.

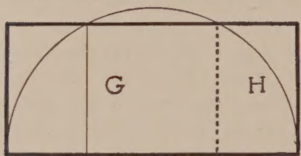


Fig. 3.

It was because of this simplicity in the root-two series that it was chosen as the co-ordinating factor in the plan and elevation that accompany this article. The writer, who is not an architect, makes no pretense to technical knowledge, and merely seeks to show how dynamic symmetry can be used to bring definite co-ordination of the parts into any building. If his tea-house succeeds in making this fascinating study clearer to others who are seeking a control for proportion, its purpose will have been fully accomplished.

The problem chosen was to design a tea-house, suitable for an open space where all sides would have equal importance. The plan is an octagon, and the total height is nine metres. The scale is .03.

Pencil sketches having been made of the type of building required, and it having been determined that it should

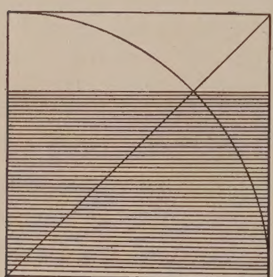


Fig. 4.

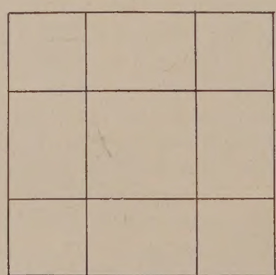


Fig. 5.

be octagonal, with columns at the angles and a balustrade above the cornice, the next step was to harmoniously relate the elevation to the plan. This was done by placing a root-two rectangle within a square in the manner shown in Fig. 4, and by placing root-two rectangles against the remaining three sides as in Fig. 5. In this way the area was divided into five squares and four root-two rectangles. The space left unfilled when a root-two rectangle is placed within a square and against one side is composed of two squares and a root-two rectangle.

So it is perfectly evident not only what was drawn into the square but what was left over, and what the values of the various parts are.

To make the octagonal plan, diagonals were drawn in the large squares as shown in Fig. 6, and the diagonals not only determine the plan but two of them cut overlapping squares from the root-two rectangle at

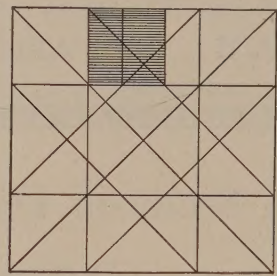


Fig. 6.

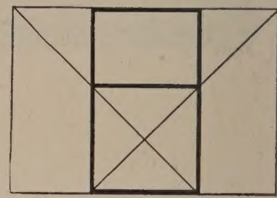


Fig. 7.

the top of the original square. As the extreme dimensions of the elevation are contained in this rectangle, whose length equals the side of the square which contains the extreme dimensions of the plan, it is evident that the containing area of the elevation is related to the containing area of the plan in the ratio that a root-two rectangle is to a square on its side.

Having chosen and drawn this relationship, it is not necessary further to employ the four squares and three root-two rectangles that fill out the original square.

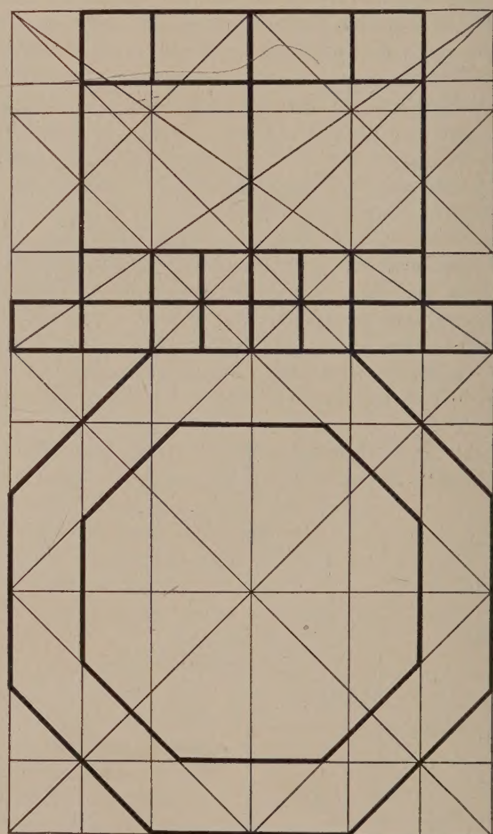
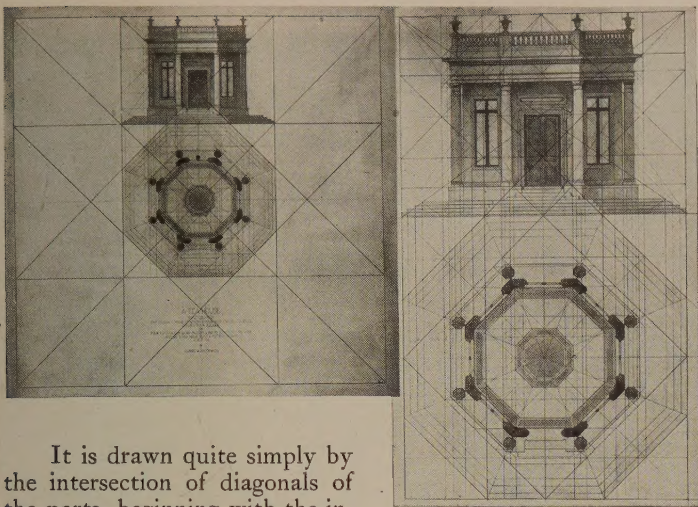


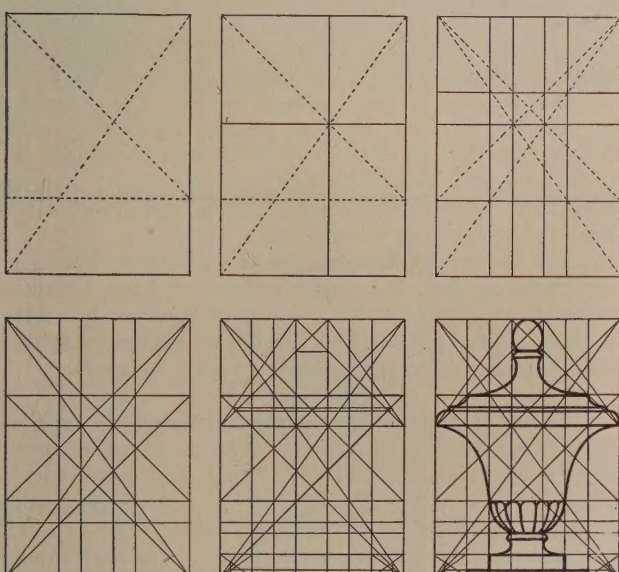
Fig. 8.

The elevation area is a root-two rectangle in which two squares overlap to the extent of a square and a root-two rectangle (Fig. 7).

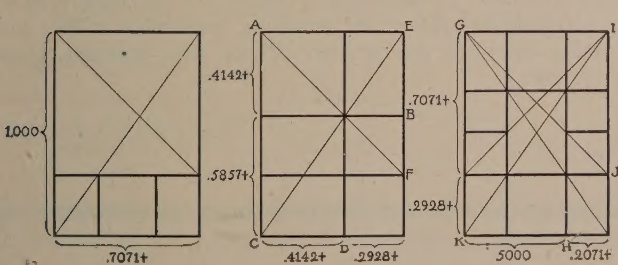
As this centre space was too narrow for the building proper in relation to the total construction, and the purpose for which it was intended, a wider area was chosen, which is equally related to the containing rectangle. The construction of this area is shown in Fig. 8.



It is drawn quite simply by the intersection of diagonals of the parts, beginning with the intersection of the diagonals of the whole root-two rectangle with the sides of the overlapping squares already mentioned. The dimensions of the building proper coincide with an area composed of two large squares, four small squares, and two root-two rectangles. The



space for the balustrade and finials is an area composed of two squares and two root-two rectangles. The area containing the steps is composed of four squares and four root-two rectangles. The smallest details—the finials, for example, each of which coincides with a root-two rectangle—have nothing but squares and root-two rectangles to determine their proportions. By no possible chance can any other form appear anywhere about the building.



$1 \div .7071+ = 1.4142+$

$.5857+ \div .4142+ = 1.4142+ .7071+ \div .2928+ = 2.4142+$

$.4142+ \div .2928+ = 1.4142+ .5000 \div .2071+ = 2.4142+$

It is impossible to express these proportions exactly with numbers, but numbers are very useful and can be carried into sufficient decimal places to answer practical requirements. They are used here to show the relationship of the linear dimensions (which is the same as that of the corresponding areas and solids) in ten-thousandths of a long side of the rectangle, the width of which is to its length as one is to the square root of two; that is, 1 to 1.4142 + .

The first division of the rectangle is by the diagonal of the whole, and that of the square in the end. Horizontal and vertical cuts through their intersection form areas that are related in the same ratio that the width of the rectangle is to its length—one to the square root of two; that is, 1 to 1.4142 + .

The area of the rectangle *AB* is to that of the rectangle *BC* as .4142 + is to .5857 +, that is, 1.4142 +.

The rectangles *AB* and *BC* can also be measured, and perhaps more obviously, in ten-thousandths of the square *AF*. *AB* being .5857 + and *BC* .8284 + . $.8284+ \div .5857+ = 1.4142+$.

The rectangle *ED* is related to the rectangle *DA* in the same ratio. $.4142+ \div .2928+ = 1.4142+$.

The second division of the rectangle is at the intersection of the diagonal of the whole with a side of the square in the end. The area of the rectangle *KJ* is to that of the rectangle *JG* as .2928 + is to .7071 + which is 2.4142 + .

These areas can also be measured in ten-thousandths of the square *JG*. *JG* being a square is in itself a complete unit of measure 1.0000. *KJ* is .4142 + of it. $1.0000 \div .4142+ = 2.4142+$.

The rectangle *IH* is related to the rectangle *HG* in the same ratio, $.5000 \div .2071+ = 2.4142+$.

These operations could be continued to infinity to determine decreasing and varied, but always related proportions. The above, however, constitutes a simple demonstration of a method for controlling space relationships, which is new at least to our time, and which it is reasonable to hope may improve much that is now commonplace in the proportions of everything that has form.

The employment of two elements of measurement instead of one introduces at once a variety combined with harmony which it is quite impossible to obtain by the methods that have been generally used.

If linear measurement was employed, variety was lost. If reliance was placed on the eye alone, perfect harmony of proportions could at best be only approximated. It was because the first was felt to be unsatisfactory that so many attempts have been made to depart from its monotonous 1, 2, 3, 4, 5, 6 ratio by using five-eighths, two-thirds, etc.

It was because no one was better pleased with the uncertain results of personal judgment that the use of the metre, the foot, or of some module has been so persistently maintained.

None of the methods proposed by Mr. Hambidge can ever do more than help the artist. His discoveries do not constitute a "royal road" to design, and least of all do they provide a substitute for genius; but any one of the three methods is more varied and interesting than our present way of working, and one wonders at the lack of invention which has for so many centuries restricted the co-ordination of design proportions to either the use of a single selected form or else to the uncertainty of individual taste.

Bank Plan vs. Bank Functions

By R. W. Bauhan

DURING the recent meeting of the American Bankers' Association there was no one who discussed the "fitness-to-function" element of banking, from an architectural point of view. There was no one who treated the subject of bank-plan with relation to the functions performed in the bank, and this is not surprising since they were naturally interested in what might be called the bigger problems —the relation of the bank to the rest of the world and to one another. They left matters concerning the daily operation of the bank to be handled as private domestic issues, and whether the furniture or vault were in the front, side or rear of the bank mattered little when bigger issues were on hand.

The arrangement or plan of a bank with relation to the functions performed is, however, a problem which every banker has considered at one time or another. Every bank officer has his own opinion on what the layout of the bank should be, and if given the opportunity would express himself as freely as the lady of the house who knows what constitutes good arrangement in the home. As a result of several interviews with these men it is pleasing to note that, although there are different points of view according to the size of the bank to which a man may be accustomed, there is, nevertheless, a concurrence of opinion of the main issues.

The first consideration of the arrangement of the bank concerns itself with the relation of the public space to the banking space. Circulation space for customers may occupy as much as half of the floor plan of a bank, but the position and shape of the property allotted to the building will determine the public area. The property location is of utmost importance because it will govern the access to light. If the bank is to be on a corner, the problem of light is easily handled, for windows along the street side provide adequate light and air; if, however, the bank is between two buildings, it becomes necessary to rely upon light from the front and rear or from overhead when conditions permit.

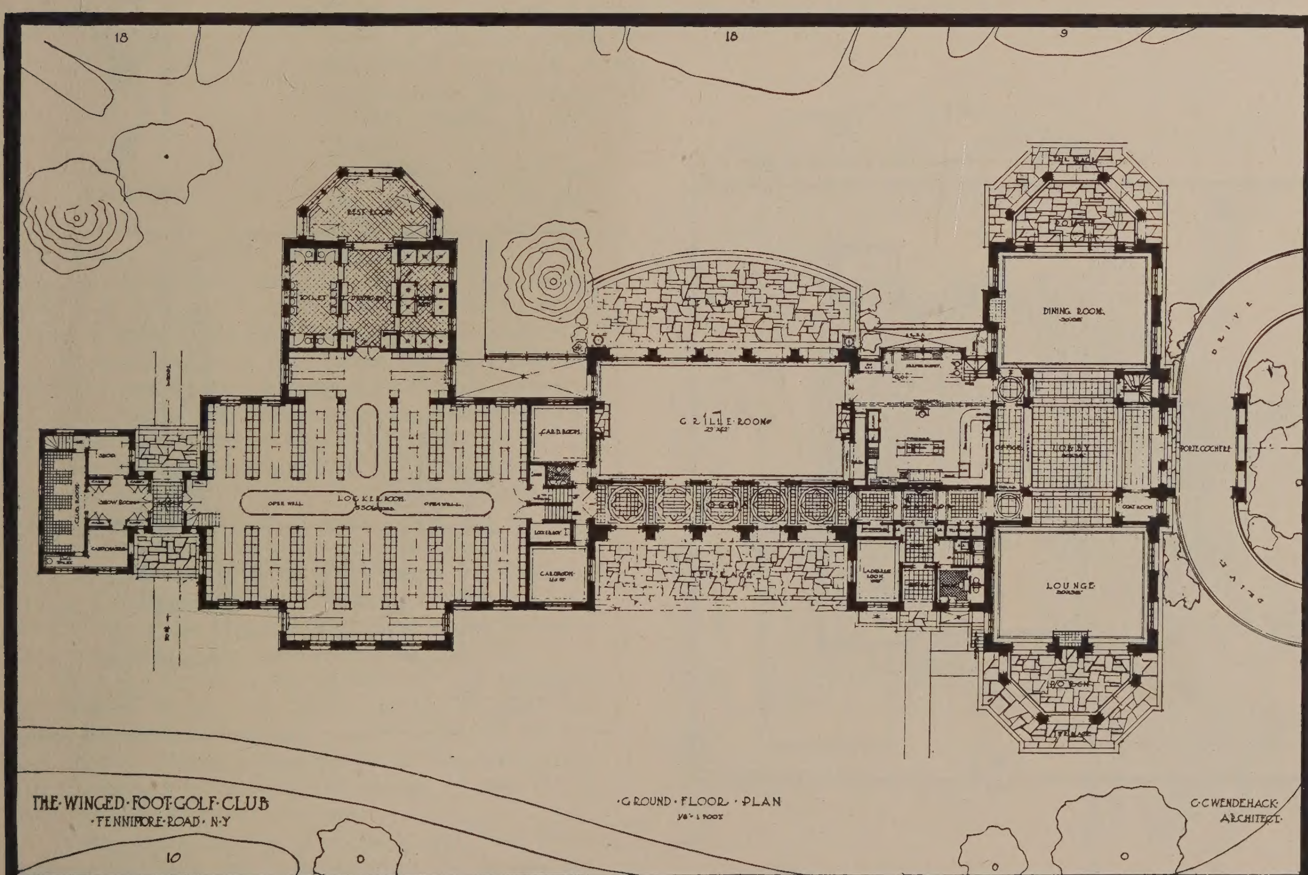
Most banks may thus be classified as corner banks or non-corner banks, and their plan will often vary accordingly. The corner bank has the advantage of light, ventilation, dual entrances, and more adequate accommodations for both customers and bank representatives. The corner position also offers more types of plan than the non-corner plot. The public space may be along the street walls and the tellers along the other walls, or it may be at one side with the banking functions taking place where there is plenty of light. Many variations of plan have been tried, but it is generally recognized that the bank with the public space in the centre and the banking functions distributed along the sides produces most satisfactory operation, whether there be one or two entrances and irrespective of the size of the bank. This plan allows the customer to come into the bank and see at once the department he is looking for. There is spread out around him the functioning elements of the bank, and he does not even have to ask where the president is. In addition, this plan lends itself to a more simple dignified architectural treatment, for it becomes one rectangle within another, and axes readily establish themselves. The non-corner bank offers two main alternatives, the centre space being allotted to the public or to the banking functions; and as in the case of the corner bank, the plan with the public space in the centre has proved to be the more advantageous.

A feature of bank planning irrespective of location which has recently been considered expedient, is the relation of the level of the first floor to the sidewalk level. With the increasing need for banking space, the use of the basement has become important. By raising the first floor sufficiently above the sidewalk to allow light to enter the basement and to provide a dry area, it has been possible to install safe-deposit vaults and coupon departments below the first floor, accessible from the street by a few steps in the case of the corner bank. In addition, rest-rooms and retiring-rooms for employees, as well as board of directors' meeting-rooms, have been arranged for in the basement, thus allowing the first floor to be used for the functions of banking which accommodate the larger number of customers.

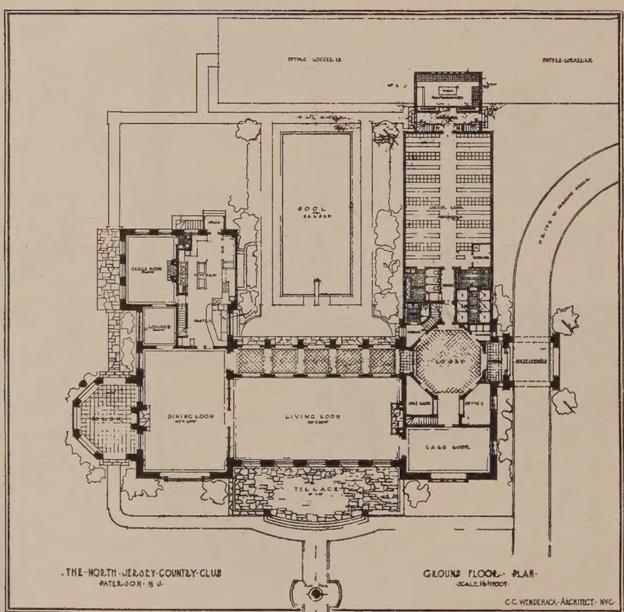
The position of the vaults is one which is determined by the type of plan. In most efficient banks the vault is located near the rear of the bank, with the safe-deposit vault in the basement directly below the teller's vault. This simplifies the construction problem and in most cases assures adequate access from the exterior.

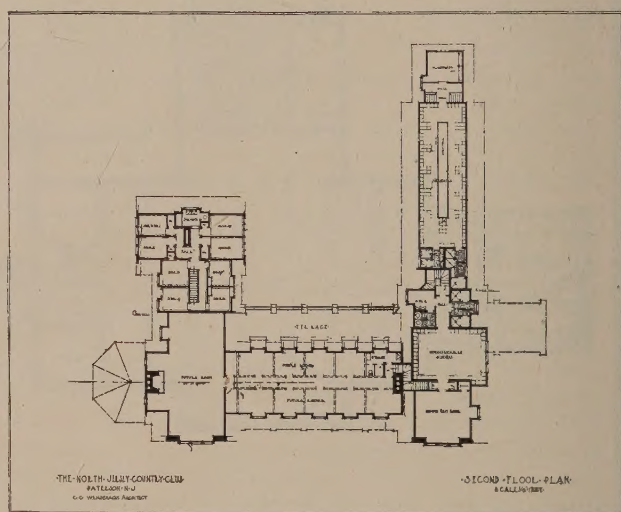
The location of departments of banking, as bonds, foreign exchange, etc., is a matter which each bank determines for itself according to the amount of business transacted, so that no attempt has been made by bankers to establish a definite scheme of arrangement to cover all cases.

Finally, the space allotted to officers causes a difference of opinion according to temperament. From an impersonal point of view, most officers agree that it is better to have officers' desks within full view of the public space where customers may have easy access to them. The man with a nervous disposition prefers a room where he may be alone and have quiet conference with his clients. He dislikes the openness and the sensation of activity which the presence of people coming and going stimulates. Where the space allotted to officers is open, it is found expedient to assign one side of the room to them, and the opposite side to the clerical force with circulation space for the public in the centre. When the officers' quarters are to be concealed behind the clerical staff at the sides or the rear of the bank, there is greater confusion in operation, for clients must be directed to their destination, and often pass through lines of customers. A successful arrangement has been found in placing the officers at the entrance, sometimes with a mezzanine floor for one or two officers who transact special business.



THE WINGED FOOT GOLF CLUB, FENNIMORE ROAD, NEW YORK. C. C. Wendehack, Architect.





THE NORTH JERSEY COUNTRY CLUB, PATERSON, N. J. C. C. Wendehack, Architect.

Old Wrought Iron in New Orleans

By Albert H. Sonn

With Drawings by the Author

THERE are signs, lately, of a genuine country-wide revival of interest in the work of the Colonial smithy, that are very gratifying to those who have always appreciated the beauty of these masterpieces of the painstaking and all but forgotten iron-workers of the past.

Rear View of Old Catch Ursuline Convent NO.

Front View of Old Latch Ursuline Convent N.O.

The modern Aladdin with his tempting offers of new things for old is fast destroying the historic and artistic heritage of many an interesting town. New Orleans has had its full share of suffering from this species of genii, but its old French Quarter is still rich in specimens of charming and quite unique wrought iron that are well worth serious study.

The ironwork of the Vieux Carré is quite different in character from that of the original thirteen colonies, and has an individuality all its own. There is a richness of ornament, a peculiar touch, an indefinable something in the movement of the curves that is rather baffling at first glance.

When one turns to the early history of this settlement on the Mississippi and remembers the Spanish and French influences at work there, one is less puzzled. The Cabildo itself is a concrete illustration of this hybrid combination of influences, these Franco-Castilian motives.

A close student of New Orleans wrought iron accounts further for its departure from the conventional, by reminding us that the labor in that vicinity in those days was largely done by negro slaves.

The lay-outs or suggestions of the patterns were probably the work of French or Spanish draftsmen, or were taken from foreign designs. But the peculiar little deviations in execution were doubtless whims of the colored artisans. Some of the unique motifs on the grilles, balconies, and balustrades seem to have been worked out on the spur of the moment as the worker's fancy suggested or the space demanded.

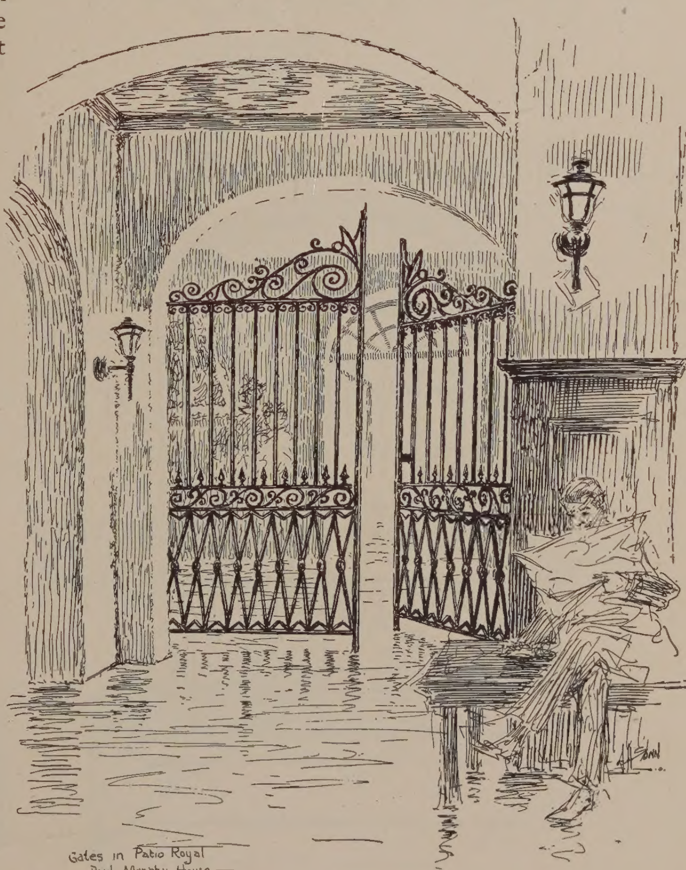
In many instances the supports for the balconies (or galleries, as they are locally called) show a most happy blending of delicacy and strength, of beauty and utility. Where a light motive is used, strength is often obtained by uniting two braces, or assembling them at more frequent intervals.

There are a number of excellent specimens of interior or bar gates still to be found in this quaint old section. Especially worthy of study are those in the famous Paul Morphy house, or Louisiana Bank building (the first bank in the Mississippi Valley, erected in 1804)—so the tablet reads. Another is located at 912 Royal Street, barring the entrance at the end of Court, while the one at the corner of Royal and St. Louis Streets merits more than a passing notice.

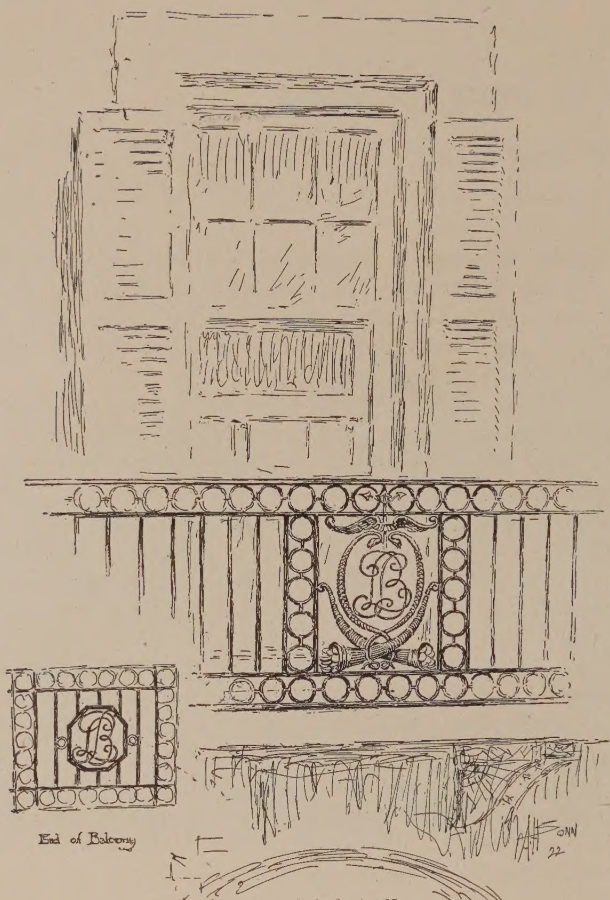
The old Cabildo and its surrounding group of buildings contain many fine examples, and particular attention should be given to the three different designs on the balconies of its front façade. The gateway, too, at the entrance will attract the eye at once and, while not as ornate as one would expect, it is impressive, dignified, and decidedly utilitarian.

A peep at the gate-house of the old Ursuline Convent, the oldest building of the Louisiana Purchase, is well worthwhile.

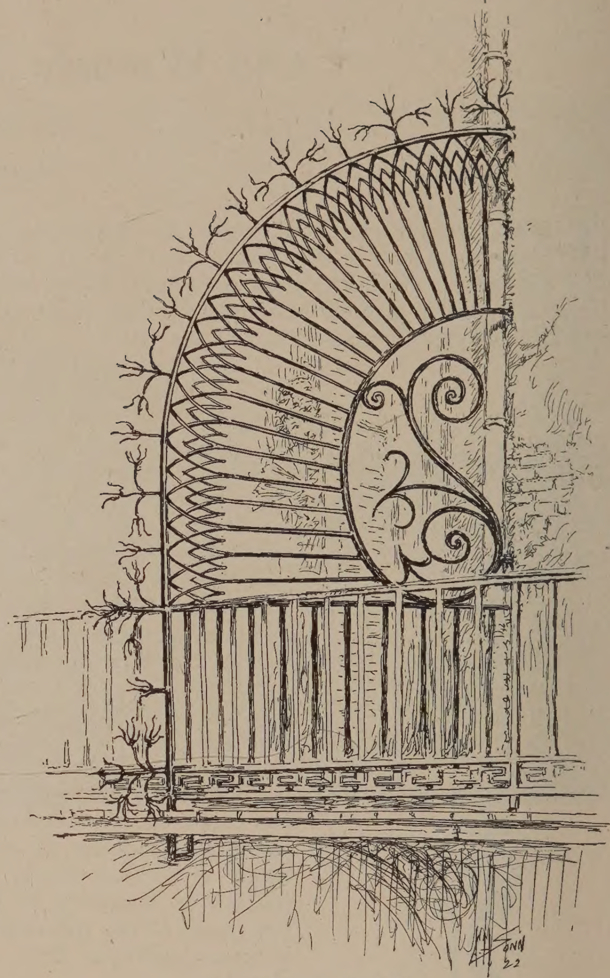
One may wander along many of the old streets of the Quarter and have the pleasant sensation of rediscovering some half-hidden specimen that it is quite impossible in a short article of this kind to bring to light. The diligent searcher will find much to repay him in contemplating the handiwork of these Knights of the Anvil of bygone days in New Orleans. Whether they were black or white, they were artists of no mean order.



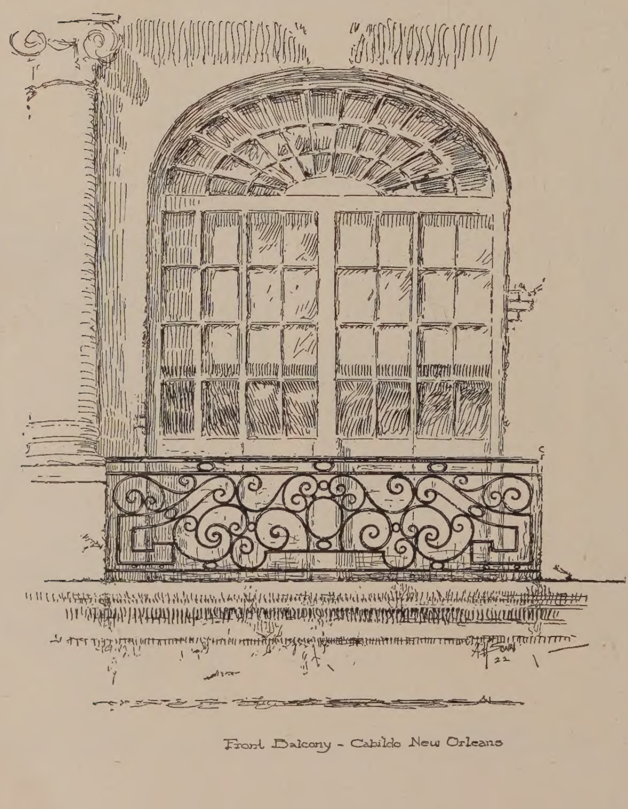
Gates in Patio Royal Paul Morphy House —



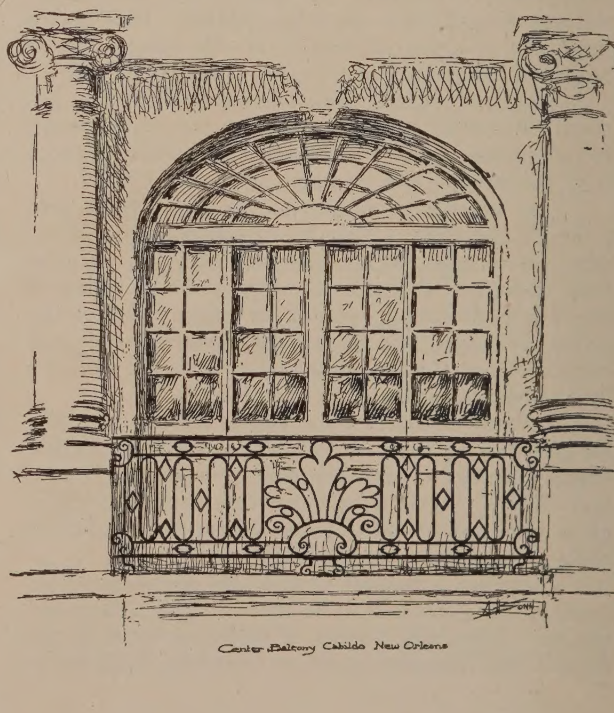
Balcony Paul Morphy House – New Orleans



Balcony Screen – Royal St

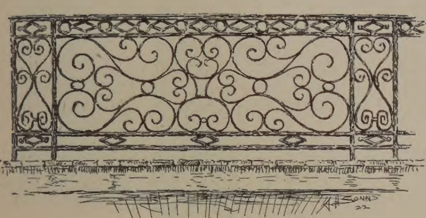


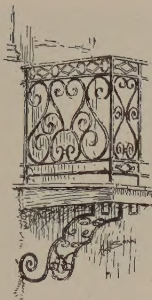
Front Balcony – Cabildo New Orleans

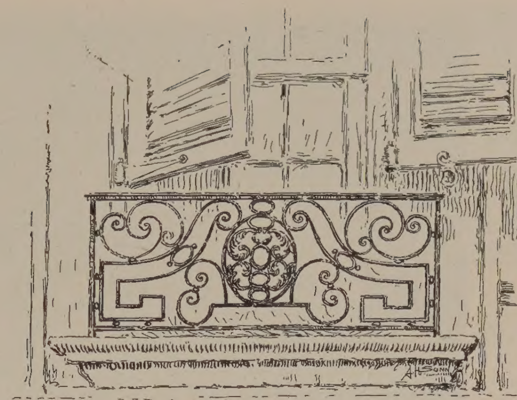


Center Balcony Cabildo New Orleans

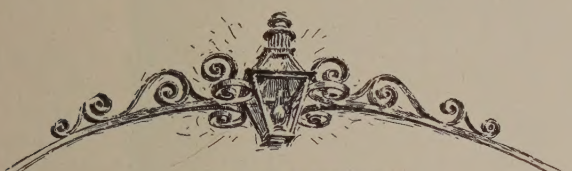
Royal and St. Louis Sts.
New Orleans



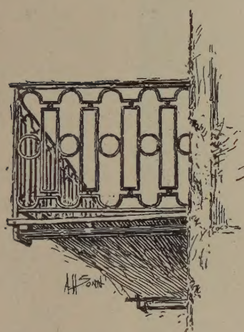




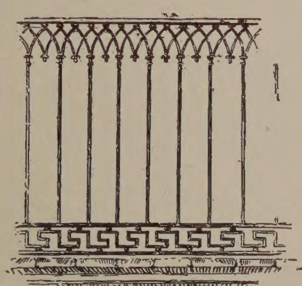
South Side Balcony of the Cabildo
New Orleans



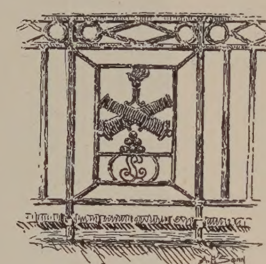
Old Wrought Iron Lantern - Cabildo



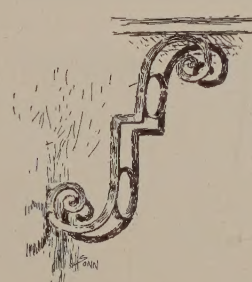
St. Louis & Chartres Sts

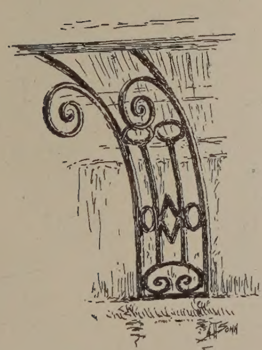


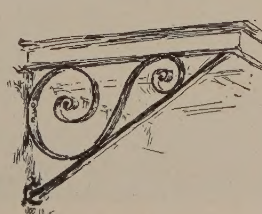
Chartres St. New Orleans
Center Monogram.

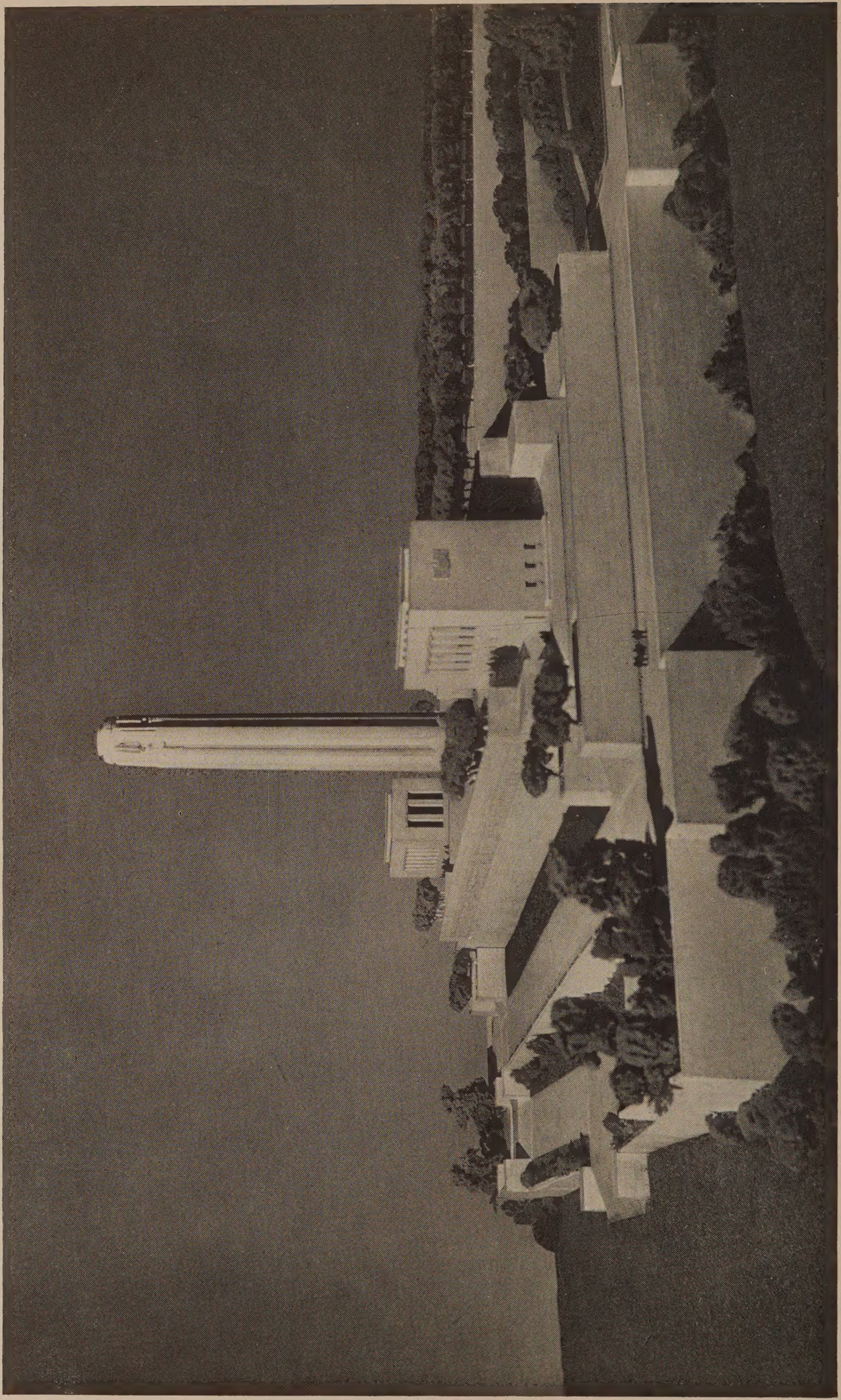


Old Arsenal - Cabildo N.O.
Rear Balcony - Center









LIBERTY MEMORIAL, KANSAS CITY, MO., FROM THE WEST, AS FINALLY DEVELOPED.

H. Van Buren Magonigle, Architect.

Editorial and Other Comment

The City Beautiful

FRANCIS D. GALLATIN, the Commissioner of Parks for Manhattan, New York, has been saying some things in the newspapers recently worth more than casual consideration. He has pointed out the fact with which we are all familiar and as applying to all of our cities, that we lose so much, miss so many opportunities for beauty, by an utter disregard for what has been done before. A new investor comes along, tears down an old building, and engages an architect to design a new one, quite regardless usually of a sense of fitness or any thought of harmonizing the new structure with those already existing.

Given a fairly harmonious group of buildings of good design, even the casual passer-by finds in them a source of pleasure and satisfaction, even if he may not know whether they are based on Gothic or Italian Renaissance or just a lot of styles, none of which is sufficiently emphasized to provide a classification.

One may walk from one end of Fifth Avenue to the other and find evidences of all the styles that ever existed, with some that one wishes had never been born.

Block after block presents a jumble of unrelated buildings, high and low, wide and narrow. The eye is rarely focussed long enough on any group to carry away any lasting impression.

In the long vista of Fifth Avenue we know of but one block that presents a harmonious and pleasing sense of considered design, in all of the adjoining buildings, and fortunate indeed were the architects of the beautiful St. Thomas's Church in having for neighbors business men who had a fine regard for the fitness of things. The block we refer to lies on the west side of Fifth Avenue, between 52d and 53d Streets, and includes some of the most attractive shops on the street. Here is an object-lesson for all to see and contemplate, and one that, if advertised enough, should have a salutary effect.

Another instance of a fine consideration for its neighbor is shown in the handsome Gothic building occupied by The Hampton Shops opposite St. Patrick's Cathedral.

We are already wondering about the new buildings that are to find their resting-place in the great stone quarry that has been excavated on the site of the old Buckingham Hotel. Here is a wonderful opportunity to do something distinguished and at the same time show a proper regard for the position and character of the Gothic cathedral that is the key-note and dominating structure of the neighborhood. Too late to make "the city beautiful," beyond the National Capital, in our land of the so-called free, at least in our time; but we may put some hope in the future, for as things go, few of our present-day buildings will survive many years. We tear things up with a ruthless eye on greater rentals and higher taxes, and nothing is sacred, no memorial of the past is safe from destruction, nothing of beauty is worth preserving just for the mere sake of beauty or for the sake of some old tradition whose influence may have played at one time a vital part in our national life.

We forget to-morrow what has been acclaimed to-day, destroy the very foundation of our national life in the craze for bigness, for expansion, for industrialism. Give us more men to labor, open wide the gates, let us get rich in our generation, with the future we have no concern.

Mr. Gallatin referred to the great possibilities offered in the rebuilding of Park Avenue that has become the new residential region, not like Fifth Avenue, however, with a long line of costly private houses; but with big apartments of various design and varying sky and window lines quite as costly as places to live in as any of our new mid-Western millionaries may desire.

We have always been too busy to think much of mere beauty as having any revenue value in our cities or elsewhere. We build for quick and assured financial returns, just as we plaster our landscape with glaring signs announcing with ever-renewed and exasperating iteration the virtue of pink pills and the exquisite flavor and endurance of some one's rubberized gum.

We fear the city beautiful is a dream city, or a creation of fiction, so far as the present generation is concerned.

Honoring the Mural Painters of '93

HOW many of our readers recall the great part played in the success of the World's Fair at Chicago by our mural painters? How many remember the vitality, humor, and inspiration of the personality of Frank D. Millet? The Fair has been said to have marked the real beginning of mural painting in America; if not the real beginning, it certainly gave a new impetus and revealed the fact that we had artists ready to grasp the opportunity when it offered.

A dinner was given in New York recently in honor of Edwin Howland Blashfield and other men of '93, by the Society of American Mural Painters. Of those who were distinguished in connection with the World's Fair there were present: Mr. Blashfield, Gari Melchers, H. Siddons Mowbray, Edward Simmons, William de Leftwitch Dodge, Frederick Dielman, Henry O. Walker, Joseph Lauber, Isidore Konti, and Douglas Volk. The surviving members not present are Will H. Low, John S. Sargent, Herman T. Schadermundt, and George W. Maynard. There were vacant chairs placed for John W. Alexander, John La Farge, Kenyon Cox, C. Y. Turner, and Frank D. Millet.

Mr. Blashfield recalled the days of work on the Exposition, and spoke of the progress mural painting had made in this country.

And for how much of this progress are we all indebted to Mr. Blashfield's own beautiful art, to his fine seriousness and dignified conception of the purposes of art, for murals that grace so many of our important public buildings and convey their messages of inspiration to all who pass!

Thanks to You

WE are not without appreciation of the way the profession has come to our support, and enabled us to announce an almost unexampled growth in the number of our readers in the past year. The statement on our cover of the number printed of this edition is not only gratifying from a purely business point of view, but primarily a source of pride in the evidence it offers of the great value of your co-operation and help in trying making a magazine worthy of and of service to the profession whose interests it is ever our purpose to advance.

We want to make a magazine of usefulness to every architect in the country, to make it an exchange of ideas, representative of no section, but of the work of architects in every State in the Union.

Our subscribers are the men who are making American architecture better than it has ever been, who are demonstrating in every city and town in the country the value of good design and the economy of sound construction.

In the twelve numbers of ARCHITECTURE published during the year is shown a wide variety of representative work in every field of architectural endeavor, constituting an invaluable reference library.

Prizes Awarded at the Spring Show of the Academy of Design

THE following prizes were awarded for painting and sculpture in the ninety-eighth annual exhibition of the National Academy of Design, opened to the public on Saturday, March 17, at the Fine Arts Building, 215 West Fifty-seventh Street. The Exhibition will continue until April 15.

The Benjamin Altman prize of $1,000 to Paul King, A. N. A., of Stony Brook, L. I., for his landscape, "Early Winter." The Altman prize of $500 for landscape to Hobart Nichols, N. A., of Bronxville, for his painting, "Mid-Winter."

The other prizes and medals were as follows:

The Thomas B. Clarke prize of $300 to Eugene Francis Savage, Ossining, N. Y., for the composition, "Expulsion." Hallgarten prize of $300 to John F. Folinsbee, A. N. A., New Hope, Pa., for "By the Upper Lock." Hallgarten prize of $200 to Dines Carlsen, A. N. A., of this city, for "The Flemish Tapestry." Hallgarten prize of $100 to Fred Nagler, Huntington, Mass., for his portrait, "A Naturalist."

The Isaac N. Maynard prize of $100 to Jean Maclane, A. N. A., of this city, for "Blue and Silver." Saltus Medal for merit to Eugene Francis Savage, of Ossining, for "Expulsion." Speyer memorial prize, to G. Glenn Newell, A. N. A., of this city, for "Snow and Colder."

Medals and Travelling Studentship Provided by Mr. Bossom

ALFRED C. BOSSOM, architect, who was born in England and studied there, and received many scholarships himself and who has been practising successfully in America for a number of years, is offering silver and gold medals and travelling studentship to English architectural students.

All large architectural schools in Great Britain are invited to compete. The Royal Institute of British Architects will annually arrange a problem of some definite practical existing condition that will have to be met, and designs will be submitted in each of the competing schools.

The problem will be the designing of a commercial structure such as an office-building, hotel, apartment-house, warehouse, etc., for which the student will have to submit not only the design, but also the most accurate approximate statement of costs and a financial statement as to the probable revenue, up-keep, costs, depreciation, etc. In other words, a complete financial statement of the entire undertaking.

The judges will be composed of a group of men consisting of a prominent architect, a prominent builder, and a prominent business man, who will check up on all points of merit.

A silver medal will be awarded to the best design submitted in each school. The winners of these medals will send their drawings to London, where the Royal Institute of British Architects will judge them, as mentioned above, and select the best one, which will receive a gold medal, and the winner will also have a trip to America, where he will stay and study for six months the American architectural methods. On his return to England he will be required to write a report on his findings, and copies of this report will be distributed among all the schools that have submitted designs in the competition.

An Interesting Exhibition by the National Sculpture Society

THE National Sculpture Society of New York will hold an indoor and outdoor exhibition of American sculpture this spring in the galleries and on the terraces and grounds of the museums located at 156th Street and Broadway. The exhibition will include the works of the most distinguished contemporary American sculptors. About 200 artists in all have had their works accepted by the jury. The works, which number about 800, range from large monuments to small sculpture and medals. Elaborate landscape decorations are being planned which will give a most artistic setting as a background for the sculpture shown out-of-doors.

A catalogue containing 200 illustrations and complete biographical data is being issued. A small volume with illustrations, entitled "The Spirit of American Sculpture," has been written for this exhibition by Mrs. Herbert Adams. There will be a special press view on April 12, and a private view for which cards are issued will be held on April 12 and 13. On April 14 the exhibition will be opened free to the public, and will remain open until August 1.

The School of Fine Arts at Fontainebleau

STUDENTS who are thinking of taking advantage of the courses offered by the summer school at Fontainebleau for American Architects, Painters, and Sculptors are urged to enroll as early as possible in order to be sure of admission and of an opportunity to make favorable arrangements for passage.

All applications should be made: for architects, to Mr. Whitney Warren, care Beaux Arts Institute of Design, 126 East 75th Street, New York; for Painters and Sculptors, to Mr. Ernest Peixotto, care the Mural Painters, 215 West 57th Street, New York. *The American Headquarters of the School are in the National Arts Club Studios*, 119 *East* 19*th Street*, *New York*, *to which all business matters connected with the School should be addressed.*

By reason of the low cost made possible by the French authorities, the summer session of the Fontainebleau School of Fine Arts is brought within the reach of most students.

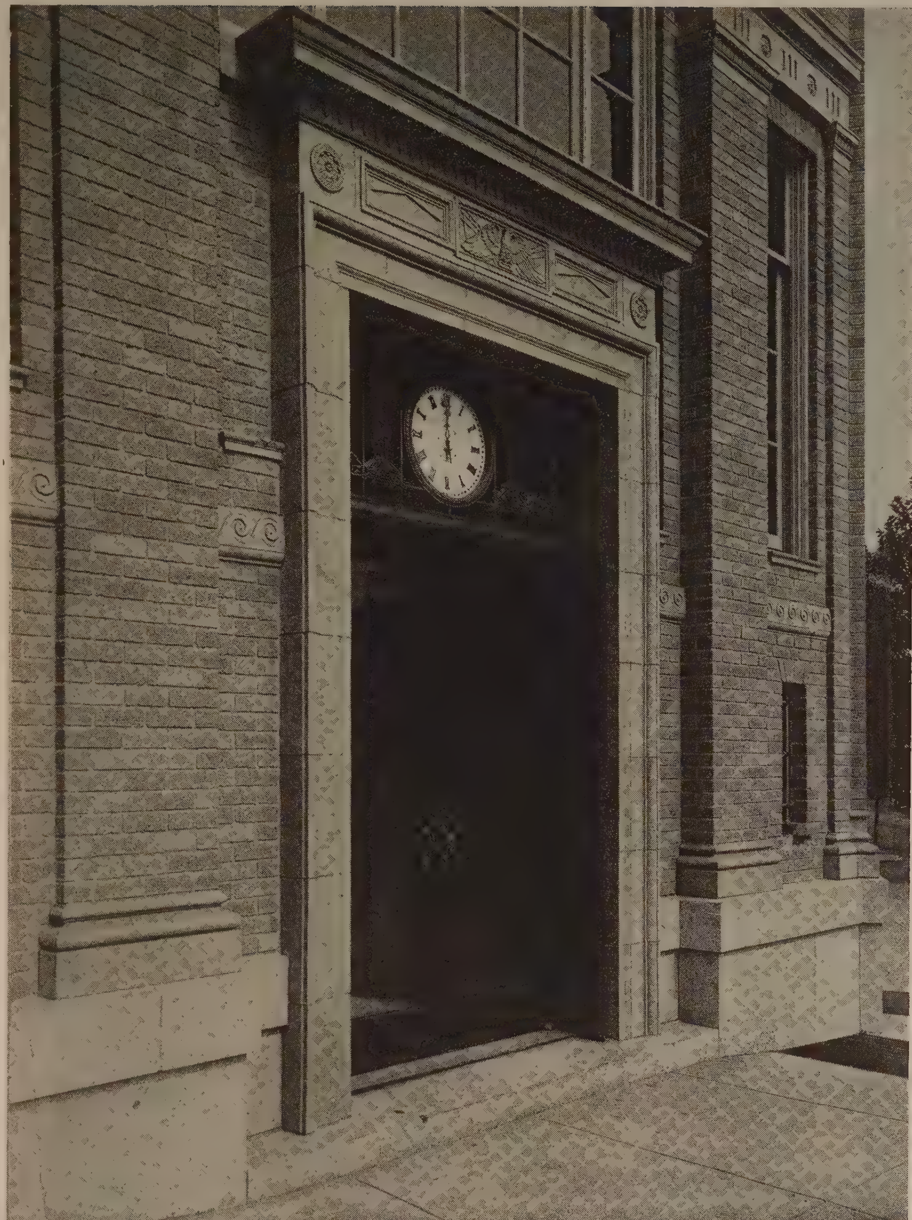
LIBERTY TRUST CO. BUILDING, NEWARK, N. J. Alfred C. Bossom, Architect.

BANKING–ROOM.

ENTRANCE TO SAFE–DEPOSIT VAULTS.

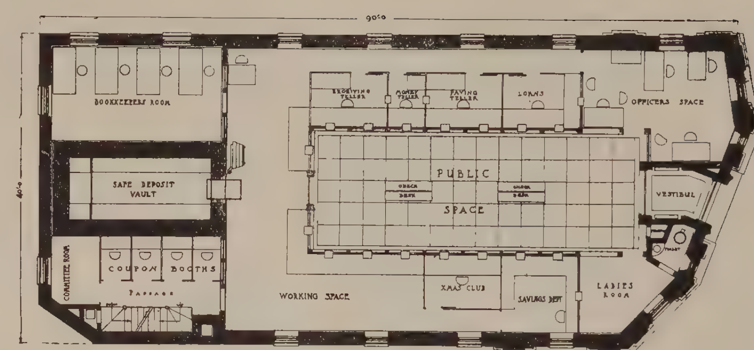
LIBERTY TRUST CO. BUILDING, NEWARK, N. J.

Alfred C. Bossom, Architect.



DETAIL.

MEZZANINE FLOOR PLAN

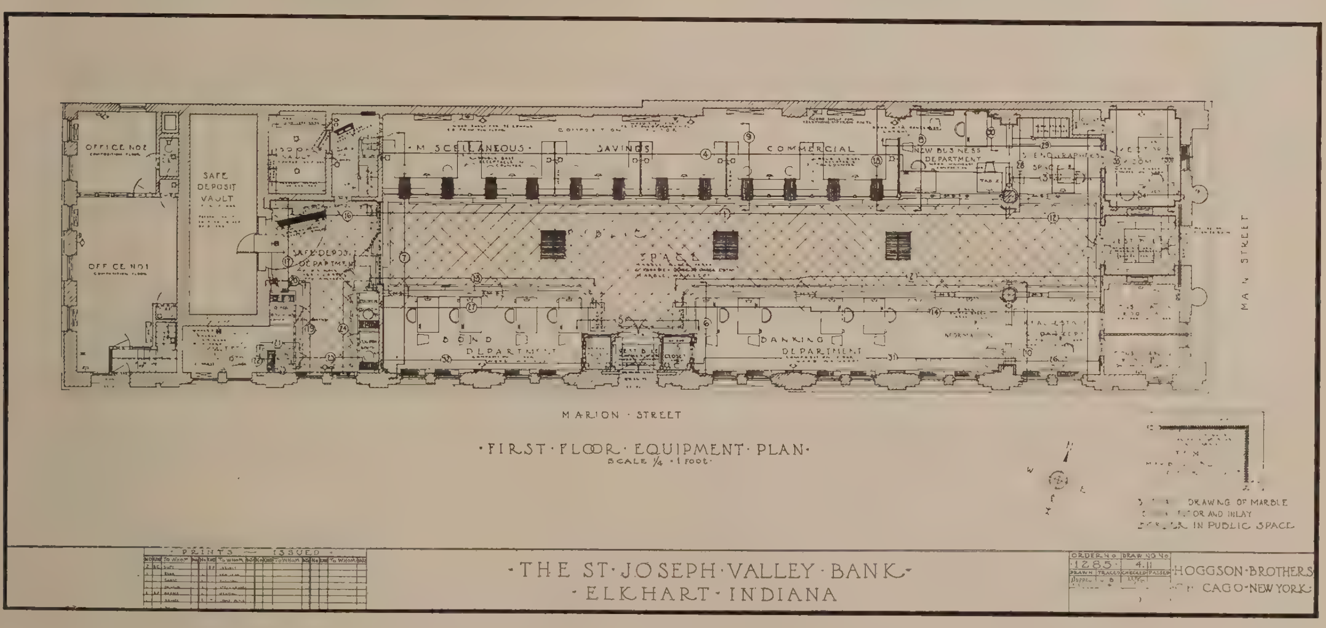


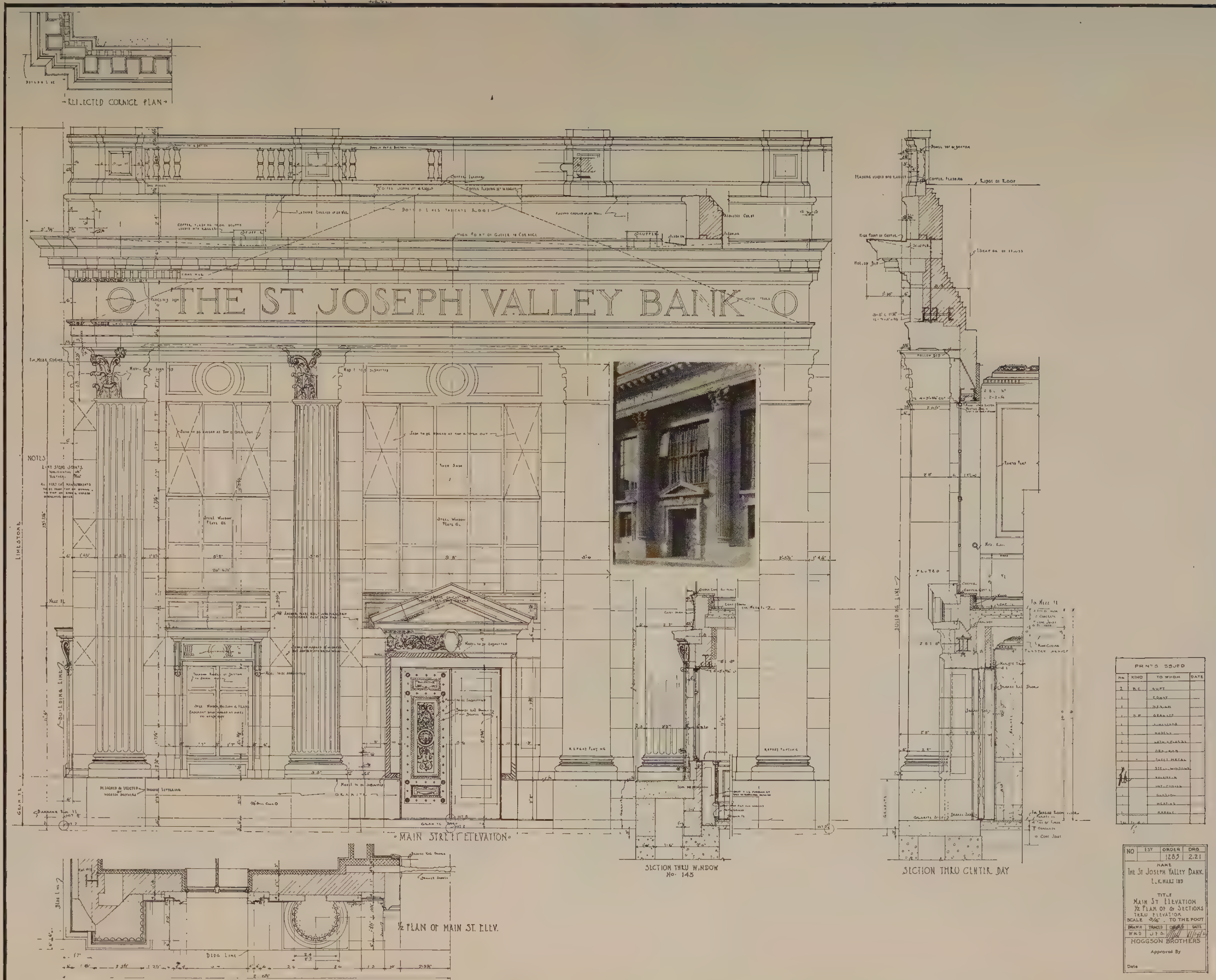
BANKING FLOOR PLAN
LIBERTY TRUST COMPANY
NEWARK NEW JERSEY

LIBERTY TRUST CO. BUILDING, NEWARK, N. J.
Alfred C. Bossom, Architect.

ST. JOSEPH VALLEY BANK, ELKHART, IND.

Hoggson Bros., Bank Designers.


OFFICE NO 2
SAFE DEPOSIT VAULT
OFFICE NO 1
MISCELLANEOUS
SAVINGS
COMMERCIAL
NEW BUSINESS DEPARTMENT
PUBLIC SPACE
BOND DEPARTMENT
BANKING DEPARTMENT
MAIN STREET
MARION · STREET
·FIRST·FLOOR·EQUIPMENT·PLAN·
SCALE 1/4 · 1 FOOT
PRINTS — ISSUED
·THE ST·JOSEPH·VALLEY·BANK·
·ELKHART·INDIANA
HOGGSON·BROTHERS


REFLECTED CORNICE PLAN
THE ST JOSEPH VALLEY BANK
NOTES
MAIN STREET ELEVATION
SECTION THRU WINDOW No. 145
SECTION THRU CENTER BAY
½ PLAN OF MAIN ST. ELEV.
BUILDING LINE
LIMESTONE
GRANITE
PRINTS ISSUED
NO. KIND TO WHOM DATE
NO. 1ST ORDER 1283 DRG. 2.21
NAME THE ST JOSEPH VALLEY BANK
TITLE MAIN ST ELEVATION ½ PLAN OF & SECTIONS THRU ELEVATION
SCALE ⅜" TO THE FOOT
HOGGSON BROTHERS
Approved By
Date

PLAN.

BANKING-ROOM.

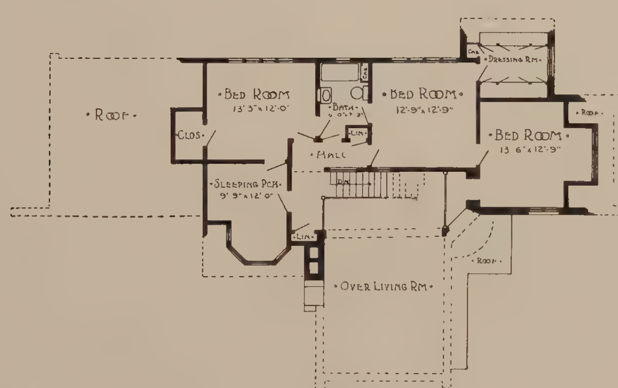
STATE SAVINGS BANK, HARTFORD, CONN.

B. W. Morris, Architect. J. F. Bacon, T. H. Ellett, L. S. Weeks, Associated.

MERCHANTS BANK, UTICA, N. Y. Bagg & Newkirk, Architects.

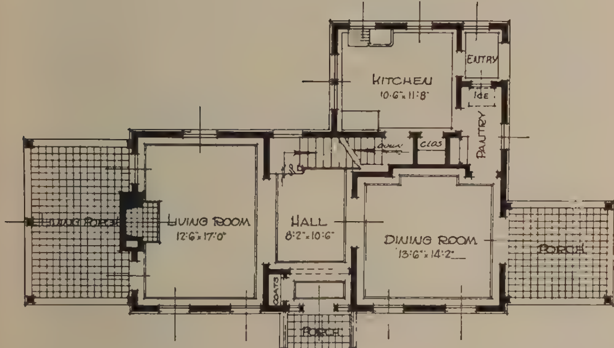
HOUSE AT LOS ANGELES WITH BUILT-IN GARAGE.

Walter S. Davis, Architect.

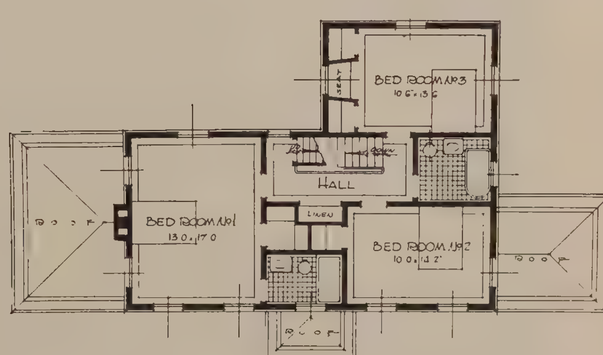


HOUSE IN LOS ANGELES, CALIF.

Frederick J. Soper, Architect.



First Floor Plan

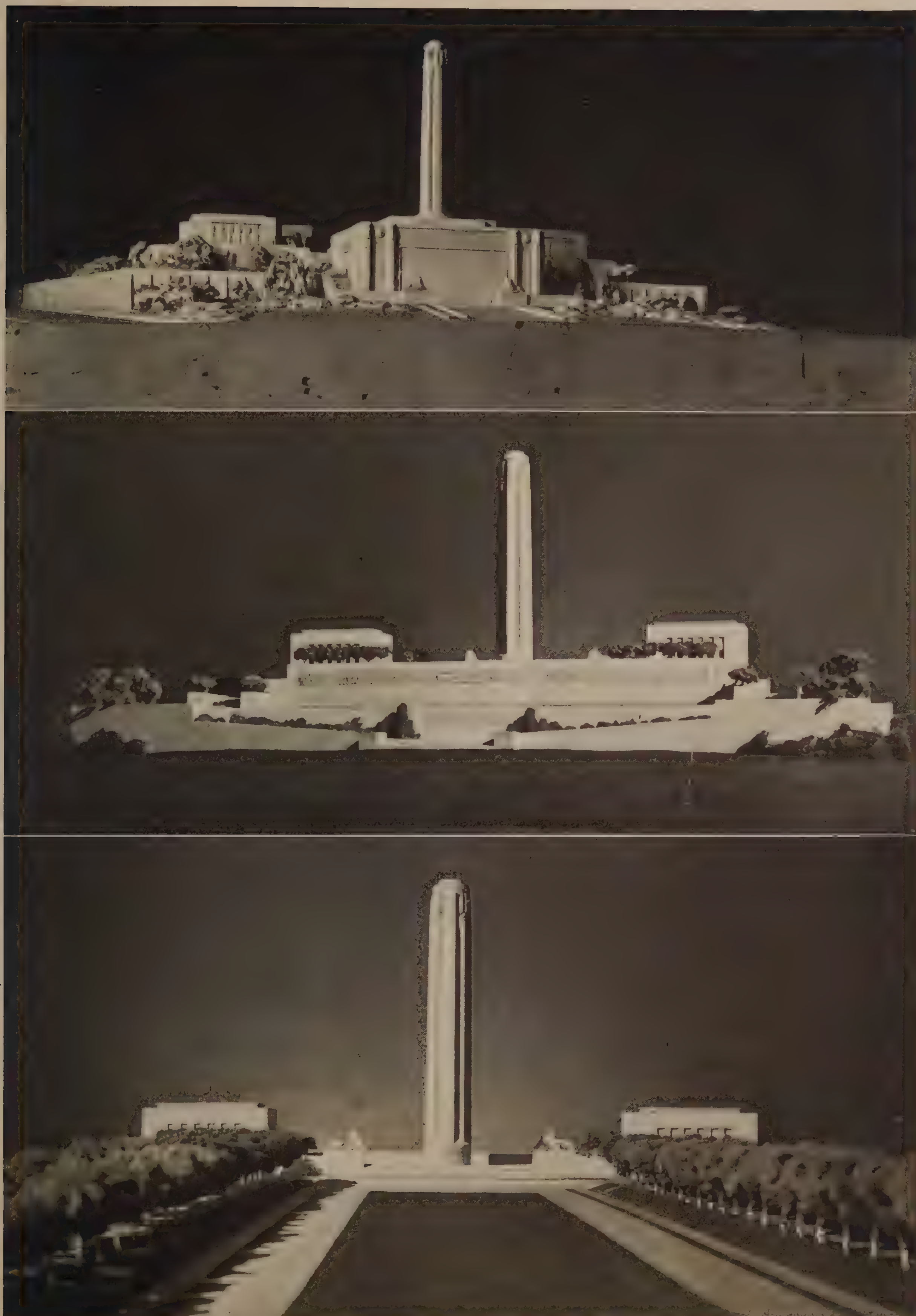


Second Floor Plan

BED ROOM AND BATH ON THIRD FLOOR

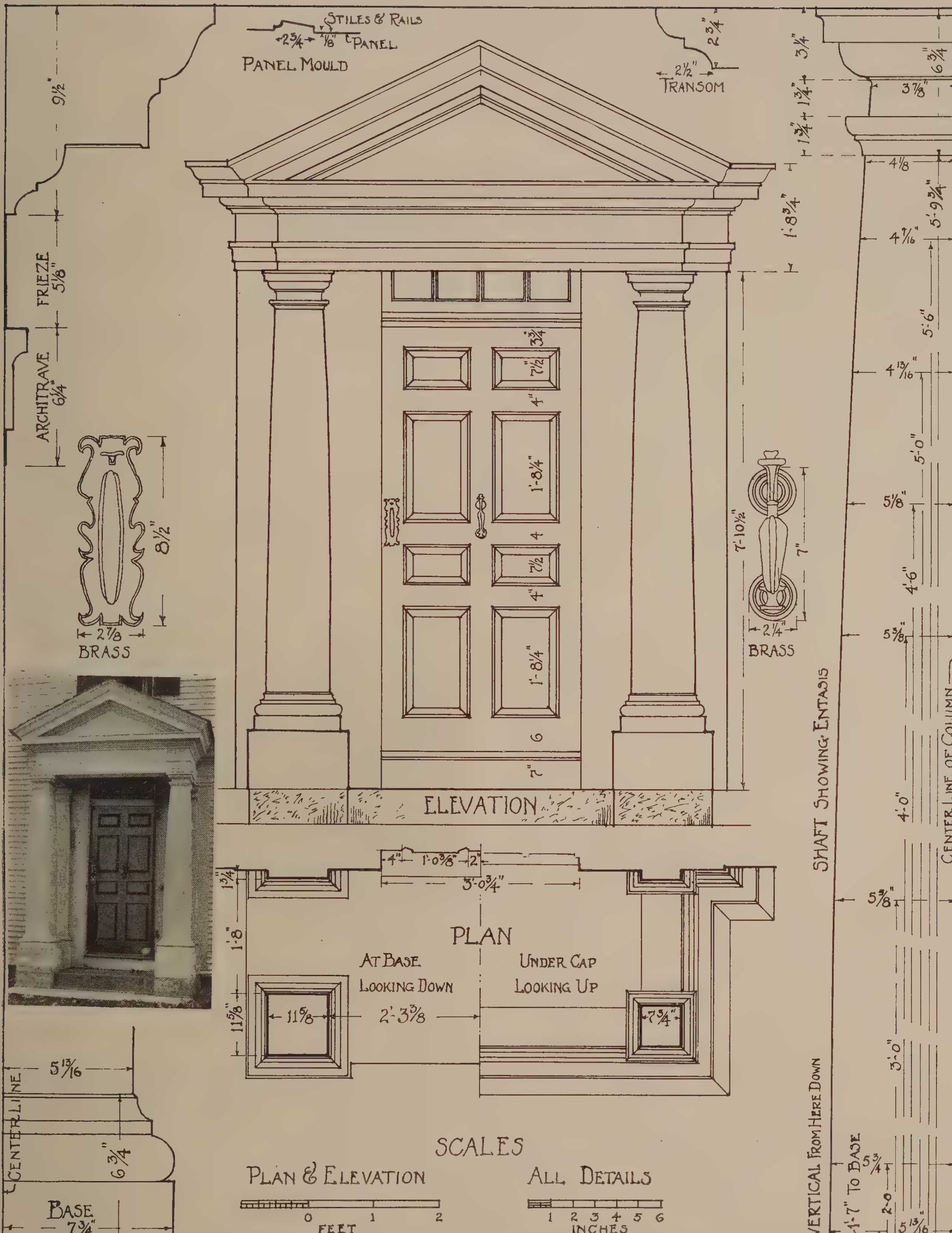
RESIDENCE, C. E. CARTER, TENAFLY, N. J.

R. C. Hunter & Bro., Architects.

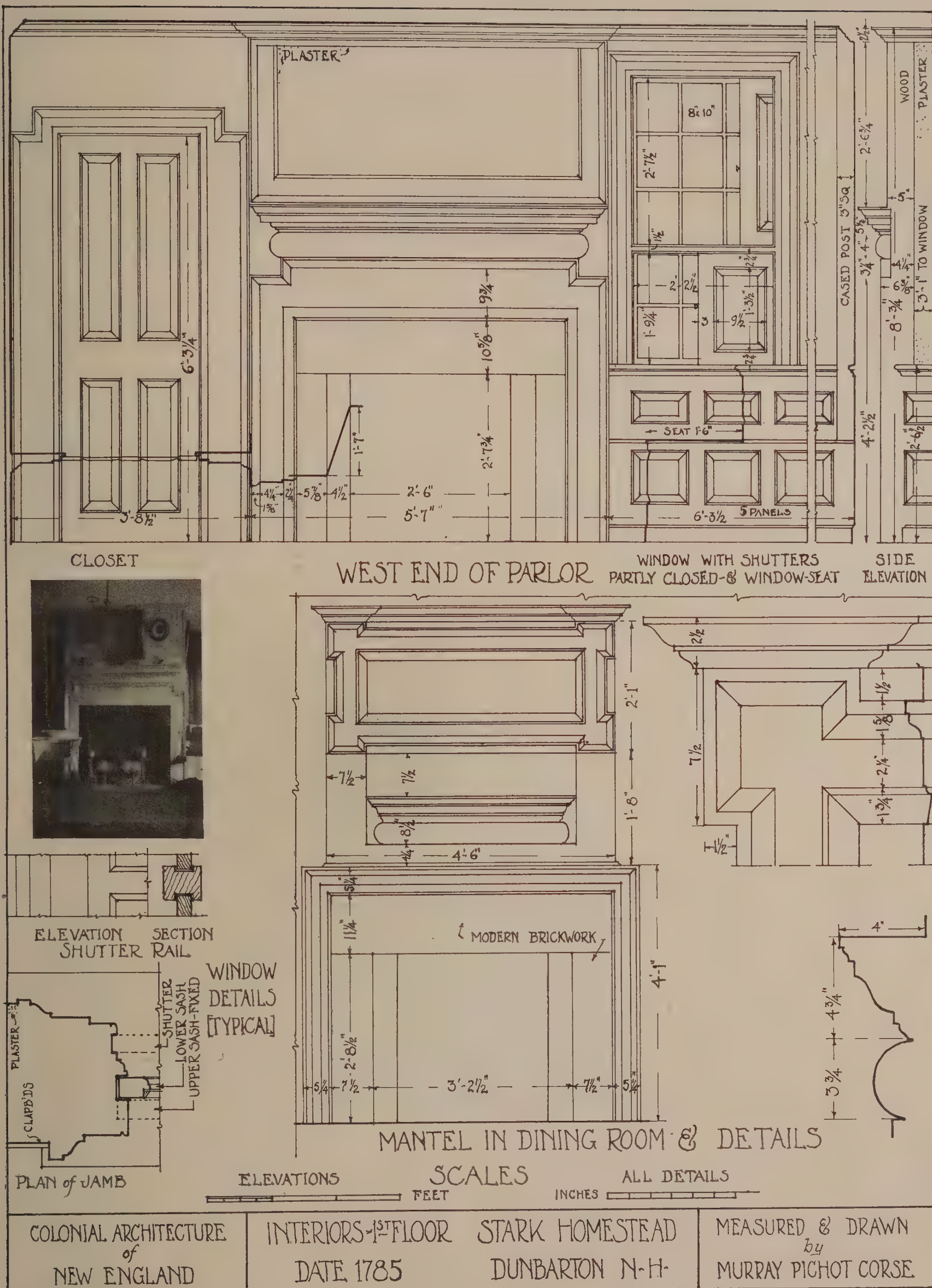


LIBERTY MEMORIAL, KANSAS CITY, MO.
H. Van Buren Magonigle, Architect.

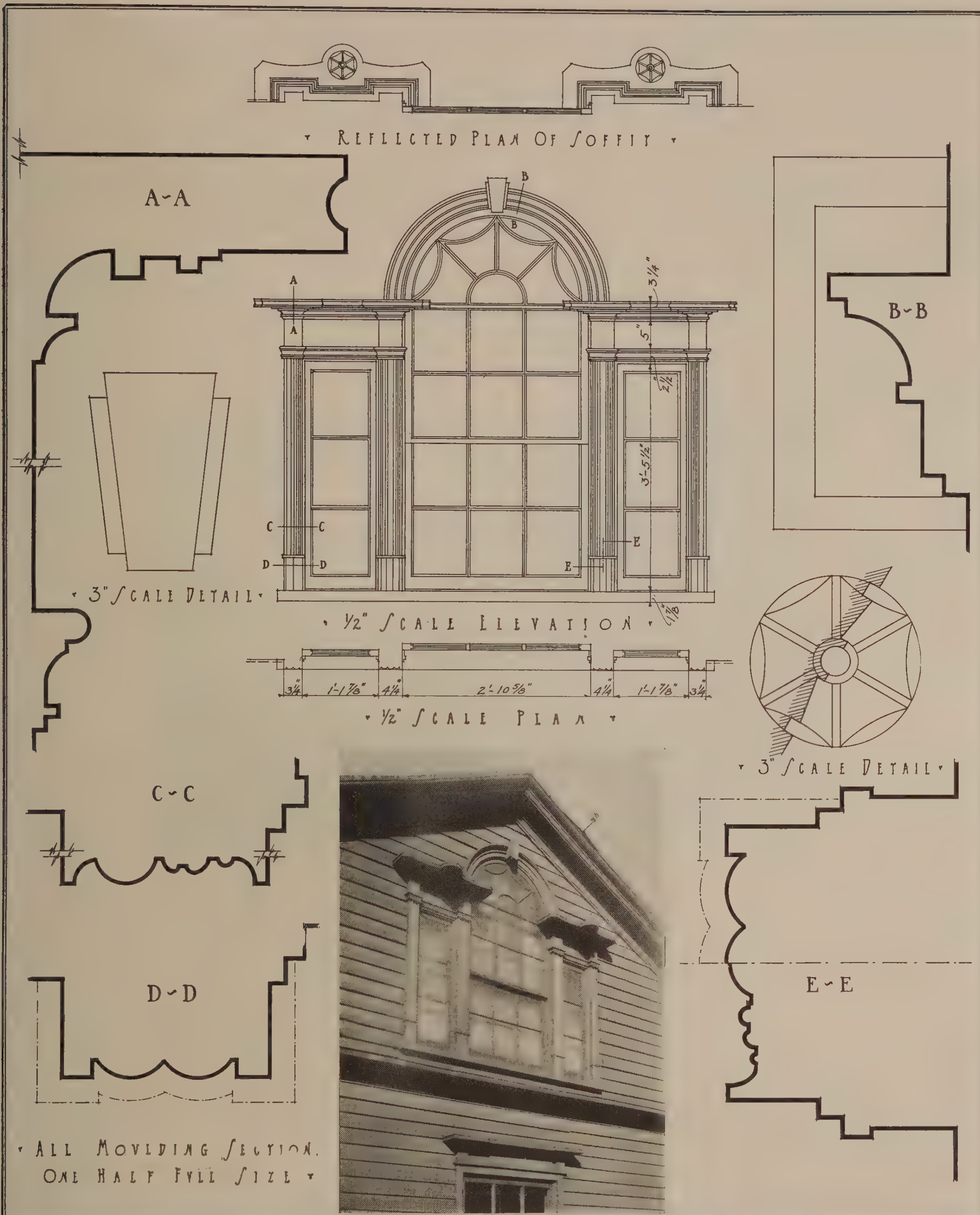
Top—Model made from competition drawing.
Middle—Final design. From the station plaza. Foreground not developed.
Bottom—Final design from the south, showing mall.



COLONIAL ARCHITECTURE of NEW ENGLAND	ENTRANCE PORCH DATE 1785	STARK HOMESTEAD DUNBARTON N. H.	MEASURED & DRAWN by MURRAY PICHOT CORSE



PLASTER
8x10"
CASED POST 3" SQ
WOOD
PLASTER
TO WINDOW
SEAT 1'-6"
5 PANELS
CLOSET
WEST END OF PARLOR
WINDOW WITH SHUTTERS PARTLY CLOSED-& WINDOW-SEAT
SIDE ELEVATION
ELEVATION SECTION
SHUTTER RAIL
WINDOW DETAILS [TYPICAL]
SHUTTER
LOWER SASH
UPPER SASH-FIXED
PLASTER
CLAPB'DS
PLAN of JAMB
MODERN BRICKWORK
MANTEL IN DINING ROOM & DETAILS
SCALES
ELEVATIONS
FEET
ALL DETAILS
INCHES
COLONIAL ARCHITECTURE of NEW ENGLAND
INTERIORS-1ST FLOOR STARK HOMESTEAD
DATE 1785 DUNBARTON N-H-
MEASURED & DRAWN by MURRAY PICHOT CORSE



EARLY ARCHITECTVRE OF CONNECTICVT	PALLADIAN WINDOW IN AN OLD HOVSE #90 ORANGE ST. — NEW HAVEN - CONN.	MEASVRED BY J. FREDERICK KELLY DRAWN BY HENRY S. KELLY

The Stark Mansion, Dunbarton, N. H.

By Murray P. Corse

TO the Cathedral of Amiens has been applied the noble title: "Parthenon of French Architecture." It might be amusing, were it not futile, to speculate on which particular edifice in this country should wear the dignity: "Parthenon of Colonial Architecture." Many authorities, indeed, would name a Southern mansion, Monticello or Homewood. New England's protagonists might split their votes between the Lee Mansion at Marblehead and Medford's stately Royall House. The latter two, at least, seem incompatible with the idea of Doric severity. Possessing something of Ionic grace, they suggest rather the Erectheum or the Wingless Victory; certainly not the Parthenon.

The Old Mansion, built in 1785.

Even to propose such a title for a simple little twelve-room house, tucked away among the granite hills, would be the height of absurdity; yet I can never stand in its shadow without a vague stirring in the memory of minor Doric temples. The entrance porch in particular, severe, simple, dignified, with its columns square in plan, of a bold entasis, which is unique in my experience, hint at some spiritual kinship to those who, so many centuries ago, brought entasis to its ultimate perfection.

Originally the main part of the house was contained in a rectangle, 43 feet 9 inches by 26 feet 5 inches; a hall, running the full depth of the building, divided it into two nearly equal parts. There was also a one-story ell which contained dining-room, kitchen, pantries, etc.; subsequent alterations have made it difficult to trace the exact dispositions. This was raised toward the middle of the last century into the two-story affair seen in the photo. As the house faces north, the principal rooms are on the north side; to the east is the living-room; on the west the parlor, with a small den back of it. These rooms are practically unchanged.

The second floor, with the omission of the ell, was identical. The parlor chamber is known as the Lafayette room; it still contains the "field bed" in which the marquis slept during his visit to the Starks, in 1824. Originally the hall ran through, but the north end was subsequently divided off to make a bedroom.

A peculiarity of the gable ends is caused by the ridge being off centre, making the pitch of the roof steeper to the north. Apparently it was desired to locate the fireplaces in the middle of the larger rooms and yet have the chimneys come out at the ridge. Although the arrangement has been criticised both favorably and otherwise, the result is interesting and unusual.

General proportions are excellent; fenestration dignified in the extreme; details show a degree of refinement not exceptional at that day, but worthy of study; especially is one struck by the extraordinary results produced with such simple means. No carving is to be found; no leaded fanlights or arched windows; nor, except on the stairs, is there even turned work.

The history of the house is not without interest. It stands on the land originally granted to Archibald Stark in 1751. John Stark, his son, familiar to us from school days, became a general in the Revolution; his wife, Molly, still more familiar, set fire to the field of grain as the redcoats approached. It was left, however, to their son Caleb to build. This young man, aged sixteen, followed his father (without permission) to Boston, where he joined the Continental force on the eve of Bunker Hill. He rose to the rank of major before retiring at the close of the war and shortly afterward, when only twenty-six years old, built this house. Here he entertained Lafayette.

The house is still in the hands of his descendants, and has become a veritable museum of Americana, owing to the fact that the Starks have married into several other distinguished American families. Here is furniture that belonged to Robert Morris, the financier of the Revolution, and connected with the Jumel-Morris Mansion on Washington Heights; to the Pierces, one of whom was first governor of New Hampshire, another a president of the United States; to the Wentworths and McNeils of Revolutionary fame; but as these are not primarily interesting to the architect it would be beside the point to detail them here. I cannot, however, refrain from calling attention to the empire piece in the hall, with its tambour doors rolled back to display the almost priceless set of "Bourbon Sprig" inside. More interesting perhaps to the antiquary is the letter "regretting" an invitation of Madam Stark's, and signed jointly by George and Martha Washington.

Drafting-Room Mathematics

By DeWitt Clinton Pond, M.A.

SIXTH ARTICLE

IN the first articles of this series there were examples given of the use of the trigonometric functions of angles. Simple problems showing how these functions can be used in the solving of problems pertaining to right triangles were given. In later articles the use of logarithms was explained and it was shown that most of the problems calling for the use of trigonometric functions were easily solved by the use of logarithms. In the last two articles attention was given to the solving of problems which were connected with oblique triangles. Such problems are somewhat more complicated than those involving right triangles, but their solution was by no means difficult.

Many of the problems given in the preceding articles were actual ones encountered in the daily experience of engineers or draftsmen, and such theory as has been commented upon has always had practical value as shown by the use of such theory in solving very real examples. In the last article no such problem was given, but the theoretical discussion regarding the formulas required in the solution of oblique triangles will be shown to have a direct relation to the calculations involved in solving the following example.

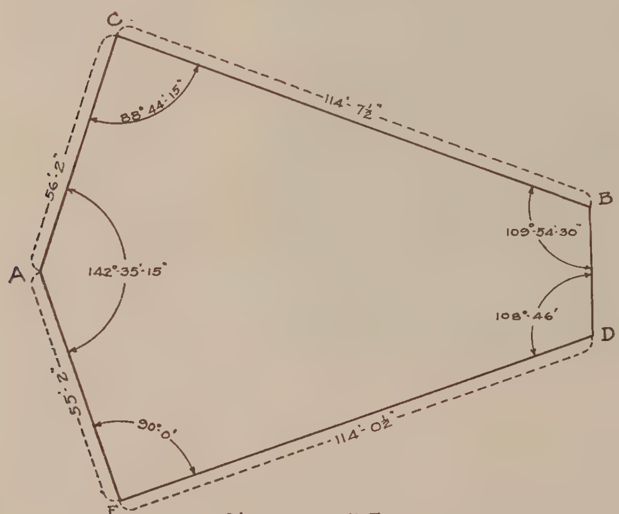


FIGURE 23

An actual condition encountered in a drafting-room will be given. There is a five-sided lot, as shown in Fig. 23. Four of the sides are known, and all the angles; but the length of the fifth side is unknown and it was left to the draftsman to determine what this length is. For the purpose of explanation the corners of the lot are noted as *A*, *C*, *B*, *D*, and *E*. *AC* is 56 feet 2 inches long, *CB* is 114 feet 7½ inches long, *BD* is unknown, *DE* is 114 feet and ½-inch long, and *AE* is 55 feet 2 inches long. The angles are shown in the figure. *EAC* is 142 degrees 35 minutes 15 seconds. *ACB* is 88 degrees 44 minutes 15 seconds. *CBD* is 109 degrees 54 minutes 30 seconds. *BDE* is 108 degrees 46 minutes. The fifth angle, which is *DEA*, is a right angle, the only one in the lot.

It is interesting to speculate upon the different methods which might be employed to solve the problem. One method, as an example, would be to draw a line from *C* to *E* forming a triangle *EAC*, in which two sides and an included angle are known. It would be possible to find the length of the side *CE* without difficulty. Then it would be necessary to draw a line from *E* to *B* and in the triangle *CEB* it would be necessary to solve for *EB*, and once this were done it would be possible in the triangle *BED* to find the length of the side *BD*. The lines from *E* divide the lot into three triangles as shown in Fig. 24.

A second method is the one which will be used below in order to find the length of *BD*, and the first method will be used to check the results found by such calculations as are involved. In the second method two radiating lines are drawn from *A* to *B* and *D*. These lines also divide the lot into three triangles as shown in Fig. 25. It will be necessary to find the lengths of *AB* and *AD* and the angles *BAC* and *DAE*, in order to subtract their sum from 142 degrees 35 minutes 15 seconds. Knowing *AB* and *AD* and their included angle it will be possible to determine the length of the third side of the triangle *DAB*.

In the triangle *ACB* the length of *AC*—which will be noted as *b*—is given as 56 feet 2 inches. The side *CB*—noted as *a*—is 114 feet 7½ inches long. Their included angle—noted as *C*—is 88 degrees 44 minutes 15 seconds. The first step will be the determination of the angle *A* in this triangle and the formula which will be used for this purpose is:

$$\tan A = \frac{a \sin C}{b - a \cos C}$$

The first step will be the listing of the logarithms of *a*, sin *C*, and cos *C*.

$$\begin{aligned} \log a &= 2.059275 \\ \log \sin C &= 9.9998925 \\ \log \cos C &= 8.34306 \end{aligned}$$

The logarithmic value of *a* sin *C* will be given by the following addition.

$$\begin{aligned} \log a &= 2.059275 \\ \log \sin C &= \underline{9.9998925} \\ & 2.0591675 \end{aligned}$$

The logarithmic value of *a* cos *C* can be found in the same manner as shown below.

$$\begin{aligned} \log a &= 2.059275 \\ \log \cos C &= \underline{8.34306} \\ & 0.402335 = \log 2 \text{ feet } 6\tfrac{5}{16} \text{ inches} \end{aligned}$$

$$\begin{aligned} b &= 56 \text{ feet } 2 \text{ inches} \\ - & \;\; \underline{2 \;\text{“}\; 6\tfrac{5}{16} \;\text{“}} \\ & \;\; 53 \text{ feet } 7\tfrac{11}{16} \text{ inches} \end{aligned}$$

The result of the last subtraction is the value of $b - a \cos C$, and it will be necessary to determine the logarithm

of this dimension and to subtract it from the logarithm of $a \sin C$ in order to obtain the logarithmic value of the tangent of A.

log 53 feet $7\frac{1}{16}$ inches = 1.72949

$$\begin{array}{r} 2.0591675 \\ -\ 1.72949 \\ \hline 0.3296775 \end{array} = \text{log tan 64 degrees 55 minutes}$$

In order to find the angle B in the triangle ABC it is only necessary to subtract the sum of A and C from 180 de-

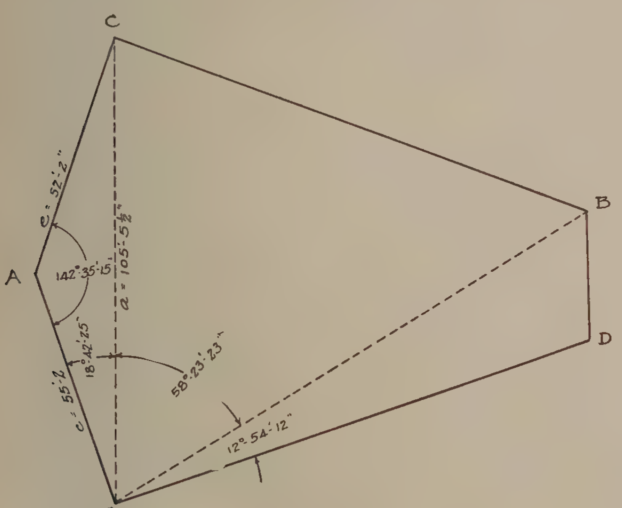


FIGURE 24

grees, and if this calculation is carried out it will be found that B equals 26 degrees 20 minutes and 45 seconds.

In this manner all the angles have been found and it is necessary to find the side c in order to obtain all the information required for triangle ABC. In order to do this use will be made of the proposition that in any triangle the sides are proportional to the sines of their opposite angles. In the present case this means that the length of the unknown side c is to the length of the side a as the sine of C is to the sine of A. If this is put in the form of an equation the result will be

$$c : a = \sin C : \sin A$$

As the products of the extremes and means are equal it is possible to arrange the values in the following manner:

$$c \times \sin A = a \times \sin C$$

From this can be developed the equation

$$c = \frac{a \sin C}{\sin A}$$

In this equation not only are values of a, C, and A known, but the values of the logarithms a and the sine of C have already been obtained, and it is only necessary to look up the value of the logarithm of the sine of A, which is 9.95698.

$$\begin{array}{rl} \log a & = 2.059275 \\ +\ \log \sin C & = 9.999892 \\ \hline & \ 2.059167 \\ -\ \log \sin A & = 9.95698 \\ \hline & \ 2.102187 = \log 126.53 \end{array}$$

c = 126 feet $6\frac{3}{8}$ inches

From the calculations given above it is possible to insert in Fig. 25 all the values of the angles A, B, and C, and the sides a, b, and c.

In the same manner as these values were obtained it will be possible to find the values of the sides and angles in the triangle AED. An important difference between the two triangles should be noted, however. The triangle AED is a right triangle and the calculations involved in finding the side e are much more simple than those used in finding the side c. The first step must be the determination of the angle EAD. There is nothing complicated about this, as it is only necessary to divide the length of the side ED by the length of the side AE and the tangent of this angle will be given. The length of the side ED is 114 feet ½ inch, or 114.042 feet, and the length of AE is 55 feet 2 inches, or 55.167 feet. It will simply be necessary to subtract the logarithms of these two numbers in order to obtain the logarithm of the tangent of EAD.

$$\begin{array}{rl} \log 114.042 & = 2.05706 \\ \log\ \ 55.167 & = 1.74167 \\ \hline & \ 0.31539 \end{array}$$

The logarithm resulting from the above calculation is the logarithm of the tangent of 64 degrees 11 minutes and 7 seconds. As the triangle is a right triangle the method of finding the length of the unknown side is the simple one of extracting the square root of the sum of the squares of the other two sides. To obtain the squares of the two sides is a simple matter if one possesses Smoley's parallel tables of Logarithms and Squares. Owing, however, to the fact that the tables are developed for lengths less than 100 feet, it will be necessary to divide the known lengths given in the problem by 2 and to make the required correction when the answer is obtained.

55 feet 2 inches ÷ 2 = 27 feet 7 inches
114 " ½ inch ÷ 2 = 57 " ¼ inch

square of 27 feet 7 inches = 760.8403
" " 57 " ¼ inch = 3251.3754
4012.2157

4,012.2157 = square of 63 feet $4\frac{1}{8}$ inches

The length of AD is twice this, or 126 feet $8\frac{1}{4}$ inches.

As a result of all the foregoing calculations the two sides, AB and AD, of the triangle ABD are known, and it

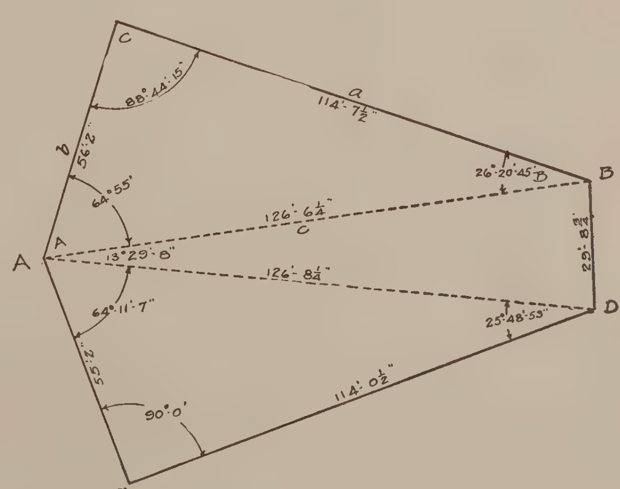


FIGURE 25

is possible to determine the angle DAB by subtracting the sum of the angles EAD and BAC from EAC.

	EAD =	64 degrees 11 minutes 7 seconds
+	BAC =	64 " 55 " 0 "
	Sum =	129 degrees 6 minutes 7 seconds
	EAC =	142 degrees 35 minutes 15 seconds
−	Sum	129 " 6 " 7 "
	DAB =	13 degrees 29 minutes 8 seconds

The next step is the determination of the side BD which is the unknown side of the lot. In order to do this the formula $a^2 = b^2 + c^2 - 2bc \cos A$ will be used. In Fig. 26 a triangle is drawn with the sides and angles similar to those in DAB (Fig. 25), but the angles are noted as A, B, and C, and the sides as a, b, and c. Both c and b are over 100 feet long, and so it will be necessary to divide each dimension by 2, if it is desirable to use a parallel table of squares and logarithms.

$\frac{1}{2}c$ = 63 feet $3\frac{3}{8}$ inches
log $\frac{1}{2}c$ = 1.80113
square of $\frac{1}{2}c$ = 4001.8803
$\frac{1}{2}b$ = 63 feet $4\frac{1}{8}$ inches
log $\frac{1}{2}b$ = 1.80170
square of $\frac{1}{2}b$ = 4012.4307

log cos A = 9.98786
log 2 = 0.30103

This completes the list of all the values which must be looked up in the tables. The first step is the addition of the squares of the two sides.

square of $\frac{1}{2}c$ = 4001.8803
\+ " " $\frac{1}{2}b$ = 4012.4307
8014.3110

The next step is to find the logarithmic value of $2 \times \frac{1}{2}b \times \frac{1}{2}c \times \cos A$, which can be obtained by the following addition.

log 2 = 0.30103
log $\frac{1}{2}b$ = 1.80170
log $\frac{1}{2}c$ = 1.80113
log cos A = 9.98786
3.89172 = log 7793.33

The only remaining step is the subtraction of the second result from the first.

8014.31
− 7793.33
220.98 = square of 14 feet $10\frac{3}{8}$ inches

It will be necessary to multiply this value by 2 in order to obtain the correct value of the side a in Fig. 26, or the side DB in Fig. 25. 14 feet $10\frac{3}{8}$ inches $\times 2 =$ 29 feet $8\frac{3}{4}$ inches.

As has been stated in previous articles no result such as this should be considered correct without checking. It is possible in all problems of this sort to check results and to know for a certainty that the dimension given to DB is the correct one. The method first outlined can be used as

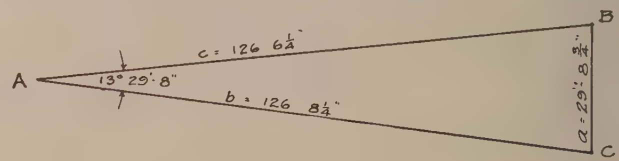


FIGURE 26

a check and it will be found to be slightly more tiresome than the one given above, as it will be impossible to make use of the right triangle AED.

Another item which complicates the calculations is the fact that the angle EAC is an obtuse angle, and that the functions of this angle have negative values. In Fig. 24 certain of the dimensions and angles are noted as shown. The triangle EAC has two sides, c and e, known and the angle A. In order to find a use can be made of the formula

$$a^2 = c^2 + e^2 - 2\,ce \times \cos A$$

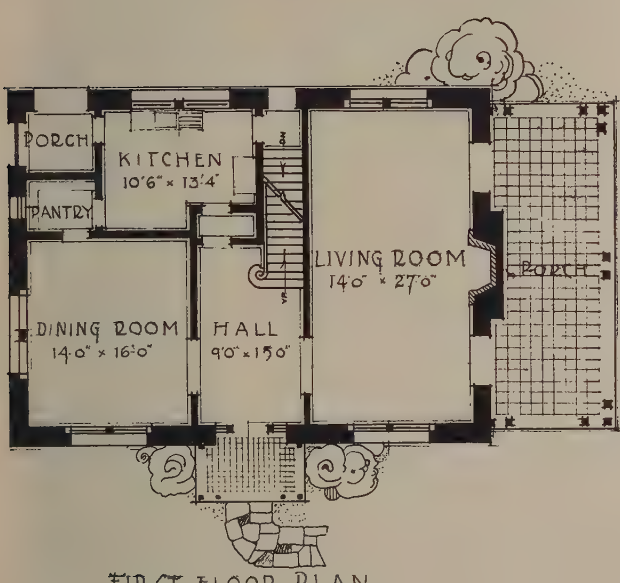
These letters are somewhat different from those found in the common formulas, but their use will be found to be simple enough if the figure is consulted. The fact that the angle A is an obtuse angle will cause the value of the cosine to be negative. Except for this the formula can be developed in the usual manner. As the value of a will be found to be greater than 100 feet it will be necessary to extract the square root of c^2 after that dimension is determined by obtaining the logarithm of 11,120.8555 and dividing by 2 and then finding the corresponding number, or by extracting the square root in the ordinary arithmetical manner.

All the other calculations are similar to those already described and it will not be necessary to carry them all out. If the reader cares to do this as a matter of exercise he will find that the result of this method of determining the side BD will check with the one obtained above within a very small fraction of an inch. With a lot having sides as long as those shown in the accompanying figures it would be too much to expect an exact check.

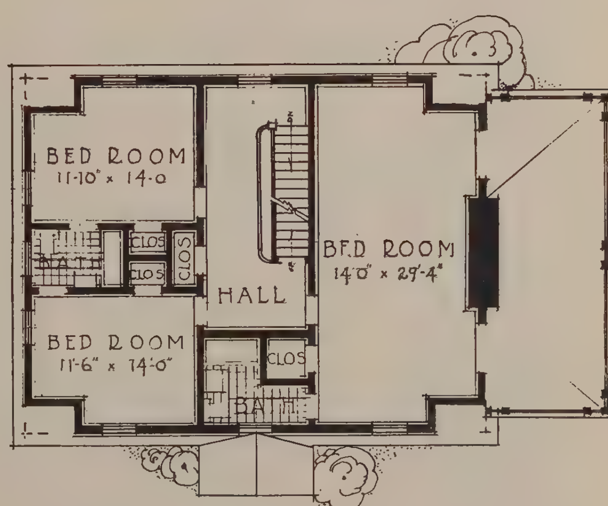
The reader may think that the methods used in this article are not as simple as might be. In this case it will be interesting to see if there is a more direct method of finding the length of the unknown side.

The Sky-Scraper Beautiful

"SO far as American business buildings are concerned, they are considered, generally, to be 'sky-scrapers,' a type of erection banned by the building codes of practically all European cities; an unnatural growth, the unavoidable outcome of an inflation of real-estate values arising from conditions unlikely to occur in Europe. The sky-scraper has, from the time of its invention, been one of the stock arguments against any possible development of architectural dignity in the American city; but the work of Cass Gilbert, and many others, has proved to the entire world that the resourcefulness of American genius could produce designs of magnificent grace based on the strict observance of what was esteemed an insuperable obstacle to beauty."



FIRST FLOOR PLAN



SECOND FLOOR PLAN

HOUSE, SIDNEY T. MANNING, ROLAND PARK, BALTIMORE, MD. Roy G. Pratt, Architect.


LIVING-ROOM.


HALL. Roy G. Pratt, Architect.

HOUSE, SIDNEY T. MANNING, ROLAND PARK, BALTIMORE, MD.

Construction of the Apartment-House

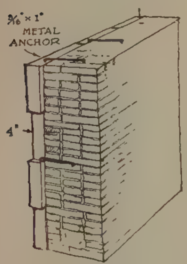
By H. Vandervoort Walsh

Instructor, School of Architecture, Columbia University

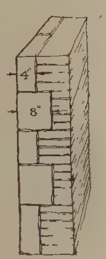
ARTICLE IV

Bonding

ALL the brick walls, whether entirely constructed of common brick or faced with beautiful wire-cut brick, or finished pressed brick, need to be properly bonded. The universal method of bonding is to introduce at intervals bricks which penetrate lengthwise into the wall, their ends only showing on the face of the wall, such being called headers in contrast to the other bricks which show their sides and are called stretchers.



WHEN·TIED·INTO WALL·IN·THIS WAY ASHLAR·CANNOT·BE COUNTED·IN·WITH WALL·THICKNESS



WHEN·ANCHORED·IN THIS·WAY·ASHLAR·CAN BE·COUNTED·IN·AS·PART OF·WALL·THICKNESS

Due to our unfortunate attitude toward city buildings and our miserable tending to architecture of only one elevation, most apartments have only their front faces built with an eye to beauty of brick bonding. The sides and courts, if they are rear courts, are nearly always built with common brick and washed over with a coat of whitewash, which soon weathers with many dark streaks and becomes gloomy and depressing in appearance. Now there is nothing ugly about common brick if it is laid properly; in fact, it has more charm than some of the expensive face brick. It is quite possible to make all the walls of an apartment have a certain charm and dignity without adding much expense, but the laws and traditions seem to have made it the set custom to whitewash all brick walls except the front. The legal requirements in this respect were expected to give more cheer and light within courts, but one need not go very far to find buildings that have lost much of their whitewash and have become anything but cheerful and light; and the law remains unenforced in having them repainted. Many courts and rear walls of apartments would look cheerier and more pleasant to-day if the law had prevented them from being painted with whitewash, and, instead, required all the bricks to be laid with white mortar joints, and ivy to be planted at the base.

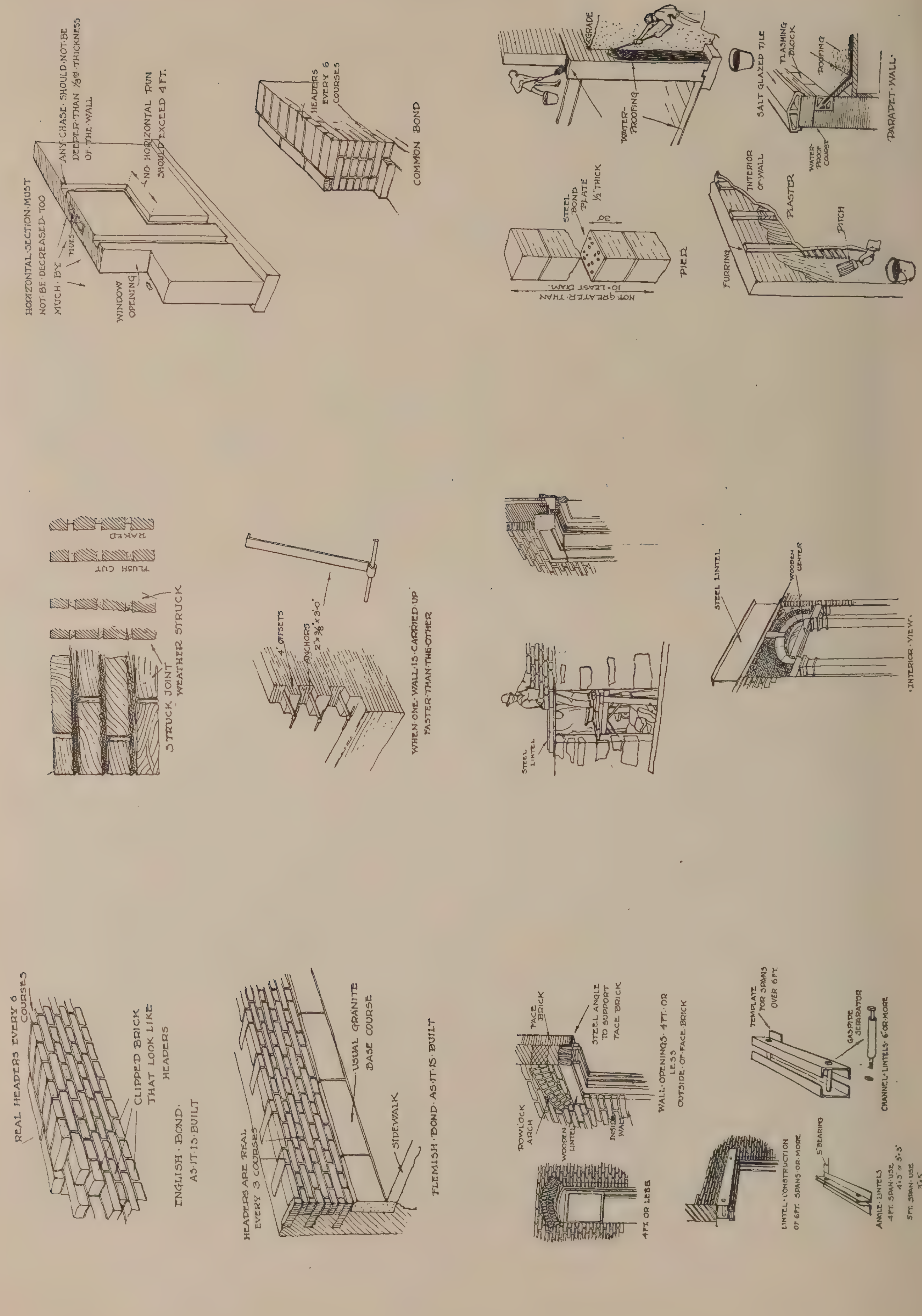
The bond employed in the construction of the court and side walls of apartments is the cheapest, and certainly does not have the interest that the English and Flemish bond have, but it is a structural bond, sufficiently strong to do the work, and if treated with a little respect may be made to look fairly decent. It is very simple, for it consists of using a header course every sixth course. But when the wall is destined to be covered with a layer of whitewash, care is never taken to bring out any of the beauty of this common bond. It is a miserable neglect of opportunities which it is hoped the builders of apartment-houses will realize some day. Indeed, with but very little additional expense, some of the rear apartments which look out upon courts might be made as desirable as the front. It is not brick walls that we really complain of having to look at in our cities, but rather brick walls that have been murdered and separated from their rightful heritage of beauty.

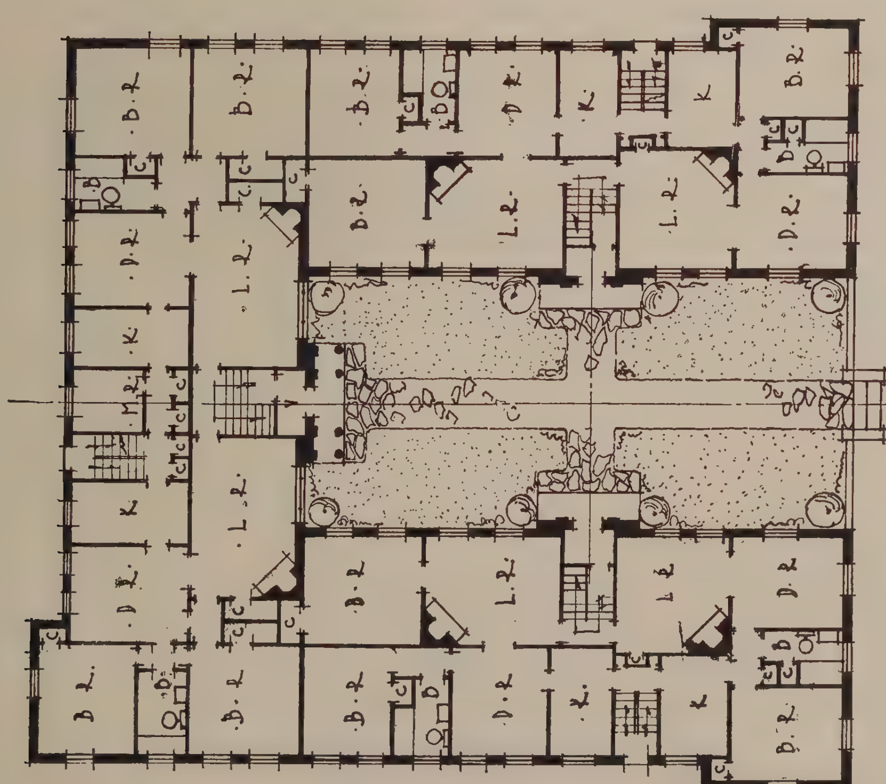
There is no lack of variety in brick bonds upon the front of apartments. One can find every conceivable combination of ugly brick texture and arrangement that one desires if one examines the average apartment-house on the street. In fact, one is deeply impressed with the great experimental field that the manufacturers of face bricks have had in the apartment-house front. It almost seems as though every wild idea or new inspiration that the makers of bricks have had found some unsuspecting builder to try it out. Bright and clashing colors, dull and gloomy tones, puzzle bonds and checker-board patterns have all been tried out in the construction of apartment fronts. It is really quite a treat to find a simple, dignified brick laid in a simple English or Flemish bond on the front of one of these buildings.

In spite of these attempts at originality, when one sees an apartment-house front built with a simple English or Flemish bond, and finished with unobtrusive joints, there is a note of individuality about it that sets it apart from the other buildings. After all, simple beauty is the most original thing, for complex ugliness is the common thing that is found everywhere. There is a great sense of composure and dignity in a wall constructed of common bricks with white mortar joints pointed with a round tool. The variety of color and irregularity of the brick is interesting, but the joints, in contrast, have a workmanlike appearance. A wall of this kind is much superior to one built with some face brick that has been cut with wires to give it an artificial texture, but which texture runs all in one direction, like the weave of a rug, and the wide joints finished with gritty roughness. One sees so much of this striving for texture in the face-brick wall, that when one finds a simple wall that seems naturally to have texture without effort, just as did the walls of old hand-made bricks, there is always a feeling of pleasure.

And when one sees the variety of patterns on the wall of brick, there is always a satisfaction to come upon a building laid with the simple English or Flemish bond, for these two are the mothers of all possible variations. The English bond upon the face of the wall appears to have courses, laid alternately, first one course of headers, then another of stretchers, and so on. The Flemish bond appears to be built with all courses consisting of alternate arrangements of header, stretcher, header, stretcher, etc. These are appearances only, for in building the English bond all the header courses are faked (clipped bricks), except at every sixth course they are full-length bricks, extending into the wall. Likewise the headers in the Flemish bond are faked, except those in every third course. Where, on the other hand, the face brick is a different size from the common-brick backing, and it is only bonded by metal clips and not counted in with the required structural thickness of the wall, it is necessary to bring the face brick and backing to a level every eight courses, and bond them with header

(*Continued on page* 132)


HORIZONTAL·SECTION·MUST NOT·BE·DECREASED·TOO MUCH·BY
FLUES
WINDOW OPENING
ANY·CHASE·SHOULD·NOT·BE DEEPER·THAN 1/3 THE·THICKNESS OF·THE·WALL
AND·HORIZONTAL RUN SHOULD EXCEED 4 FT.
HEADERS EVERY 6 COURSES
COMMON BOND
GRADE
WATER-PROOFING
SALT GLAZED TILE
FLASHING BLOCK
ROOFING
WATER-PROOF COURSE
PARAPET·WALL
STEEL BOND PLATE 1/2" THICK
NOT·GREATER·THAN 10·LEAST DIAM.
PIER
INTERIOR OF·WALL
PLASTER
PITCH
FURRING
STRUCK JOINT
WEATHER STRUCK
FLUSH CUT
RAKED
4" OFFSETS
ANCHORS 2"x3/8"x3'-0"
WHEN·ONE·WALL·IS·CARRIED·UP FASTER·THAN·THE·OTHER
STEEL LINTEL
STEEL LINTEL
WOODEN CENTER
·INTERIOR·VIEW·
REAL HEADERS EVERY 6 COURSES
CLIPPED BRICK THAT LOOK LIKE HEADERS
ENGLISH·BOND· AS·IT·IS·BUILT
HEADERS ARE REAL EVERY 3 COURSES
USUAL GRANITE BASE COURSE
SIDEWALK
FLEMISH·BOND·AS·IT·IS·BUILT
FACE BRICK
STEEL ANGLE TO SUPPORT FACE BRICK
ROWLOCK ARCH
WOODEN LINTEL
INSIDE WALL
WALL·OPENINGS·4 FT.·OR LESS
OUTSIDE·OF·FACE·BRICK
4 FT. OR LESS
TEMPLATE FOR SPANS OVER 6 FT.
GAS PIPE SEPARATOR
CHANNEL·LINTELS·6'·OR·MORE
5" BEARING
LINTEL·CONSTRUCTION OF 6 FT. SPANS OR MORE
ANGLE·LINTELS



APARTMENT-HOUSE, NEW HAVEN, CONN. J. Weinstein, Architect.

(*Continued from page* 129)

bricks or metal clips. Under any circumstances the face brick ought to be laid at the same time as the backing, and not later.

Then, too, in building bearing walls of this kind, no one side ought to be carried up faster than another, as is often done with walls covering steel structures, for the bond at the corner is weakened. Sometimes circumstances require (from the point of view of economy) the side and rear walls to be built up before the front on account of some delay in shipping face brick or cut stone. In such cases they ought not to be carried up more than two floors in advance, and then the end that is to be bonded with the front wall should have a toothed form, made with 4-inch offsets. In addition, an iron bar with one end bent over to hold a pin ($\frac{3}{8}$ inch by 2 inches by 3 feet long) should be embedded into the masonry every 3 feet in height to reinforce the bond at the corner, when the delayed wall is built up to join with the completed one.

If the wall is to be faced with stone or terra-cotta ashlar, the best custom requires that it be made 4 inches thick, with 8-inch-deep bond-stone every alternate course. However, this is expensive, and in apartments the ashlar facing is usually made only 4 inches thick, and bonded in each joint about every 30 inches linear length of the course with anchors of galvanized iron. Such facing cannot be counted in with the thickness of the wall.

As with ashlar and brick walls, correct bonding is essential to rubble-stone walls, particularly since some masons have a way of building such walls with big stones on the two faces and filling in the inside with mortar and small stones, making a wall weak down the centre. To properly bond the two faces together large stones, big enough to extend through the wall, should be laid every 2 feet in height and 3 feet in length.

Mention ought also to be made here of the bonding of piers, for these are often used in the basement of apartments to carry floor girders or columns. Any structural pier ought to be built of brick or concrete, but not stone, and laid in Portland-cement mortar, in order to be strong and stand up against fire. The height of any isolated pier should never be excessive in relation to its least thickness; not more than ten times its least horizontal dimension. None should be less than 16 square inches, and all that vary from this size up to 6 square feet in cross-section that carry girders or columns or lintels spanning more than 10 feet should be bonded every 30 inches in height, with a steel plate or a bond-stone the full size of the pier. The steel bond plates are usually made $\frac{1}{2}$-inch thick, and perforated with three $\frac{3}{4}$-inch-diameter holes per square foot of area to serve as keys for the mortar. Bond-stones are usually cut about 4 inches thick from bluestone.

Joints

The correct way of bonding bricks is, after all, not more important than the correct construction of the joints between the bricks. If one were to run a locomotive full speed through a wall that had been properly tied together with cement mortar, the hole that would be cut by this blow would show the bricks themselves through their body before they were separated from the mortar joints. If there is not a good bond between the bricks and the mortar, then the individual bricks will in a test of this kind tear away from the wall unbroken. But such a wall is not to be desired.

Of course one of the important means of improving the bond between the brick units and the mortar is to have the bricks wet before being laid into the wall, so that they will not draw out of the mortar the water that is necessary for its hardening. The reverse is also true, that the mortar ought not to be so wet that it is weakened by excessive water. This might occur when the bricks were laid almost without mortar, and the vertical joints were filled with grout (liquid mortar about as thick as cream). However, in apartment-house construction, where every dollar is counted, there is often a tendency to employ methods of this kind, and they are quite satisfactory if not carried too far. For unimportant walls, interior walls, and walls that are not exposed to weathering, grouting the joints is not unusual practice. The bricks on the two faces of the wall are shoved into a bed of mortar of the ordinary thickness, and all the bricks on the inside of the wall are laid in a full bed of mortar. The vertical joints are then filled with this soft creamy mixture of mortar by spreading a trowel of ordinary mortar over the tops of the bricks with the right hand and pouring water onto it from a dipper in the left hand, until the vertical joints are filled with the diluted mortar.

This is no kind of a wall to use for foundations or for walls to be exposed to the weather. Such walls require the bricks to be laid in a generous bed of mortar and shoved into place, thus filling the vertical joints with good mortar. Many specifications require that all bricks should be shoved, but a mason will not do this, for he knows that to shove brick all day makes a raw and tender hand. However, there is no real harm done if all the brick are not shoved, so long as those on the face of the wall are properly embedded, and bricks around chimney-flues in fire-walls and in piers, carrying heavy loads, are carefully laid with full mortar joints.

The method of finishing joints upon the face of the wall is largely a matter of taste, but for those walls which are to be covered up, like party walls, the interior face of outside walls, there is but one type of joint that is employed, the cut joint. This is made by simply cutting off the excess of mortar with the trowel.

On the face, though, the joint needs to be more carefully treated. The common-brick walls at the rear and sides and courts of apartments have the joints finished with the so-called struck joint, which is the cheapest of the finishing joints. It is made with the trowel by running it over the surface of the mortar after it has become a little stiff. Some claim that this joint is not as weather-proof as the so-called weathered joint, which is made with the trowel in much the same way except that the upper edge of the trowel is run along over the mortar, making it slope out to the upper edge of the bricks of the course below, instead of in. No very sure facts of its superiority over the struck joint are obtainable, and one thing is certain that it takes more time to execute and costs more money.

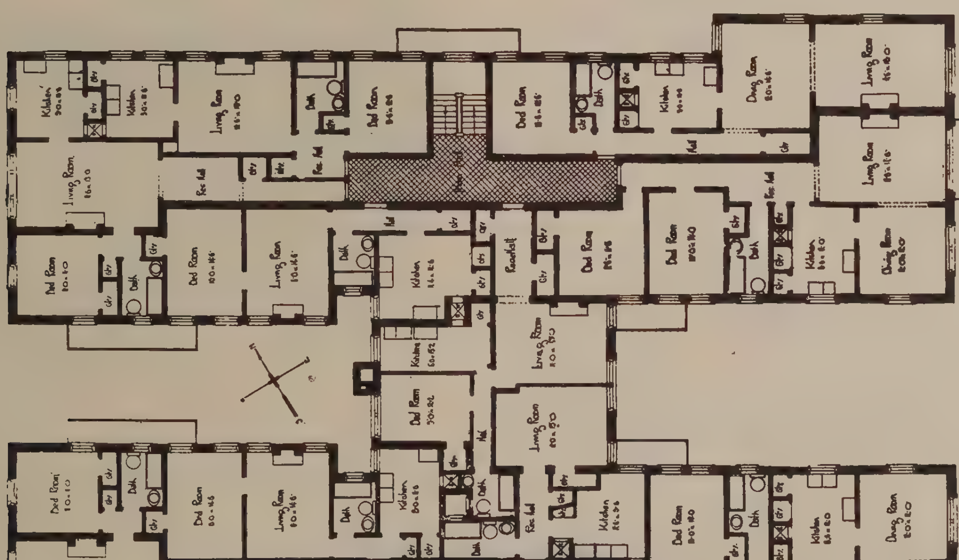
With some of the very rough-textured bricks, wide joints, 1 inch, appear well if they are cut off flush with the trowel, provided some kind of grit has been added to the mortar. Similar wide joints are also made effective by raking out the mortar to a certain depth, or even laying a strip of wood in the joint to keep the mortar back from the face of the wall.

A very effective joint for a wall faced with selected common brick is made with a round rod or a V-shaped tool. It is comparatively inexpensive, and has a finish to it that gives dignity to the wall.

Weather-Resisting Precautions

The penetration of moisture through the various walls of apartment-houses must be prevented as much as in other

(*Continued on page* 134)



APARTMENT-HOUSE, 6 ROSEVILLE AVENUE, NEWARK, N. J. Edward V. Warren, Architect.

(*Continued from page* 132)

buildings. In fact, in many ways it is more important, especially when a family like the janitor's lives in quarters slightly below grade. Conditions described in the first article showed how unhealthy it was to live in the lower floors of tenements which had no protection against the incoming ground-waters or surface-waters. In most large cities, now, laws require the waterproofing of the basement when living quarters are located in it.

The common method of doing this is to apply three layers of felt and tar to the outside of the walls, and carry this under the cellar floors, right through the wall above the footing course. This envelope of tar and felt will keep out the ordinary ground-water, if there is no great pressure. Its one drawback lies in the fact that if it is broken at any point the water percolates through this opening, and there is little chance of repairing the leak, for it is difficult to locate it from the inside, and almost impossible to get at from outside without excavating around the wall for some distance.

The tendency to-day is to use, as much as possible, waterproof coatings that are applied to the inside of the wall and over the floor. This usually takes the form of a cement plaster to which some one of the well-known waterproofing compounds has been added. For ordinary conditions this will keep the cellar dry, and if any leak develops it is possible to discover its position and repair it.

In addition to the above precautions, it is necessary to stop the upward rise of moisture from the ground through the wall. This is due to the capillary action set up by porous texture of the masonry wall. To prevent it, just above the grade level there should extend through the entire wall a layer of cement mortar with a waterproofing compound in it, or a layer of felt and pitch.

But the tops of walls allow water during a heavy storm to penetrate, as well as the bottom, unless they are protected. All parapets should be covered with stone-concrete or salt-glazed tile coping. The junction of the roof with the parapet wall should be made with the greatest care, but unfortunately this is not always done, and therefore many tenement owners have repair bills for falling plaster ceilings and spoiled decoration which could have been avoided. The very best method of joining a gravel and tar roof with the wall is to carry it up and into a flashing-block, which is a terra-cotta clock specially designed for this purpose. The right angle between the roof and the wall is avoided by building in wooden blocks to ease it off to about a 45-degree angle. This eliminates to a great extent the cracking of the roofing material which formerly occurred at this right angle.

Even though this flashing-block be used, the moisture that collects during a rain-storm will soak down through the wall unless a waterproofing course is carried through the entire thickness of the wall, or the inside face of the parapet is covered from the roof to the coping with the tar and felt.

But one does not see many examples where these flashing-blocks are used in the cheaper grades of apartments, but rather the old method is employed of carrying the roofing material up the side of the wall, and then carrying down over it layers of tar and felt, which have been inserted into the wall just below the coping, or fastened to a strip of wood nailed into a slight recess built in the brickwork. Metal counter-flashing is also employed, but unless it is copper it can hardly be looked upon as very satisfactory for this type of roof. A special type of metal flashing is made which has the end that is inserted into the joints of the masonry covered with a strip of metal that overlaps both sides, and is held in place in the joint with special flashing-hooks, driven in at intervals of every 3 feet.

Openings and Lintels

One of the real structural problems in the walls of apartments is the building of lintels over the window openings as economically as possible.

Where the openings are less than 4 feet wide, wooden lintels are usually employed with a rowlock or relieving arch above. In the best construction, these lintels are shaped at the top to form a centre for the rowlock arch above, but ordinarily they are only flat timbers, and the space between the top and the under-side of the arch is filled with clipped brick and mortar. These wooden lintels do not extend through to the face of the wall, and the window-frame and the brick mould hold the rowlock arch on the outside in place until set. Sometimes, where face brick is on the outside of the wall, it is supported upon 3-inch by 3-inch angles of steel, but the backing is built with a wooden lintel and brick arch. These lintels of wood ought not to have a bearing at their ends of more than 2 inches, so that they can, in time of fire, burn and fall out without doing damage to the wall. The rise of the rowlock arch above the lintel is usually made about $\frac{1}{8}$ of the span. As these arches are laid up with header bricks, they are designated as one, two, or three rowlocks, according to the number of courses. It is common practice to use two rowlocks in 12-inch walls with spans up to 3 feet, and three rowlocks in 16-inch walls for all spans greater than 2 feet and under 4 feet, and also in 12-inch walls with spans from 3 to 4 feet.

Spans from 4 to 5 feet are usually supported upon steel lintels built up of 3-inch by 5-inch angles with bearing of 5 inches at their ends. Spans wider than this are generally supported by two small 6-inch or larger channels arranged with their flanges inward and their flat side out and braced with gas-pipe separators at intervals. In fact, the channel lintel of this type is used a great deal for supporting walls over many types of openings throughout the building, as stair-well walls over hallways, and the like.

Where the span is greater than 6 feet the chances are that the bearing under the end of the lintel will become so great that it will exceed 250 pounds per square inch, the allowable bearing on brick masonry. It is customary, therefore, to place steel templates under the bearing ends of these lintels.

Wherever stone lintels are used they are made to support only their weight, the load of the wall coming on steel at their back.

Where the wall over a self-supporting stone lintel is supported by steel, it has been found essential to arrange this steel with ample clearance over the top of the stone lintel, so that when deflection takes place the weight of the wall will not bear down on top of the lintel and break it. Wherever possible, too, stone lintels ought to be made self-supporting, and not upheld by steel angles or channels.

Building Supervision

By Richard P. Wallis

PART III

Construction Supervision

UPON the completion and approval by the owner of the plans and specifications the project enters upon the period of actual construction. It is customary for the architect, under the terms of his contract with the owner, to supervise the work of the contractor during this period. He becomes, to all intents and purposes, the agent of the owner in seeing that the contractor carries on his work in accordance with his contract with the owner.

This responsibility requires the employment by the architect or engineer of a superintendent of construction or supervisor whose duty it is to attend to the details incidental to such supervision. These duties may, in the event of a small organization, be performed by the architect himself, but it is always advisable where possible to delegate this work to one or more of a staff especially designated for this purpose.

The work of building supervision requires certain qualifications on the part of the supervisor in order to be successful in its results. He should be entirely familiar with the rudiments of the building business, he should possess a technical as well as a practical knowledge of each of the trades that constitute the finished structure, and should be able to judge quickly for himself as to the character of the work performed by the contractor. To these qualifications should be added tact and a wide knowledge of human nature, as the success of his venture depends in no small degree upon his relations with the contractor's organization. The supervisor should maintain a spirit of openmindedness throughout his connection with the work. He should show a willingness to adopt suggestions made by members of the contractor's staff when such suggestions serve to improve the quality of the work, but should reserve to himself at all times the right to make the final decision on matters for which he is responsible.

Having carefully weighed the evidence and arrived at a just conclusion as to a proper course to pursue, his decision should be final and conclusive and should admit of no deviation therefrom. The assumption of a firm but fair attitude on the part of the supervisor in his dealings with the contractor brings the contractor to respect his decisions and tends to remove whatever element of distrust there may be present.

On ordinary projects requiring supervision, the supervisor will be interested in the quality of the materials delivered on the job and, in the case of cost plus contract, the quantity. The question of workmanship will be of considerable import and must be subject to his judgment. He will be called upon from time to time to interpret the plans and specifications where they are obscure in their meaning and to answer the thousand and one questions that inevitably arise in the construction of a building. He must see that the contractor keeps the work properly manned at all times, that the various subtrades are brought to the job in proper sequence and without loss of time, and that the progress of the work is expedited in every way consistent with good building practice. In short, his responsibilities will be to see that the contractor closely observes the spirit as well as the letter of the conditions laid down in the contract documents.

It will be necessary for the supervisor, in order to proceed intelligently in the performance of his share of the work, to visualize clearly in his own mind the problems with which he is confronted. This means that considerable time and care should be devoted to a study of the complete plans and specifications, to the end that he may familiarize himself with the structure as it will appear when complete. An early analysis of the requirements of the project will greatly aid him in grappling with the various conflicts that are certain to arise before the work is complete.

In making this analysis, the work of each of the subtrades should be considered, both as regards its relations to the main structure and to the other trades. Equipment required should be listed, together with its description and method of operation, light outlets should be checked in various rooms, plumbing fixtures and roughing in checked, etc. The specifications should be read and reread until the supervisor is thoroughly familiar with their contents, and the plans studied until he is thoroughly conversant with every detail.

The supervisor should also study the personnel of the contractor's organization, both at the job and at the main office, as it should be one's chief aim to cultivate congenial relations with the members of this organization as long as it is compatible with the performance of efficient work.

The supervisor should take the time early in connection with the job to organize and systematize his work. A definite daily schedule should be adopted, necessary reports decided upon and arranged for, regular meetings between owner and contractor should be planned for, a building programme tentatively laid out, etc.

The supervisor should arrange to make at least one complete tour of inspection each day, visiting every portion of the job where work is under way, in order that no defect may be covered up without his knowledge. During this tour he should be constantly upon the alert to note work not in accordance with the requirements. All such observations, together with any suggestions that may occur to him relative to rectifying these errors, should be noted down, preferably in a pocket-size loose-leaf note-book for future disposal. These matters should be taken up and discussed with the contractor's superintendent at the earliest possible moment, before it becomes too difficult to change any work which is not satisfactory.

It is usually customary for the supervisor to require the contractor to submit a daily statement as to the personnel of the job for the use of his home office. These reports should state the number of men of each trade employed and what work they were principally engaged in during the day, as reported by the time-keeper. The supervisor should require, from time to time, a statement of the progress made by the various subcontractors in the execution of their share of the contract. Much of this preliminary work is done in their own shops and mills and it is frequently difficult for the supervisor to keep in constant touch with them

without these reports. He should, wherever possible, follow up personally such work, in order to prevent the delivery to the job of material that he is certain to reject. Much valuable time will be saved by eliminating such faulty portions of the work in the shop rather than waiting until delivery is made to the job.

The contractor will submit on or about the tenth of each month a formal itemized statement of the amount of money disbursed by him during the previous month as supporting evidence for his monthly request for payment. The supervisor should check this statement with conditions in the field (noting how much material has been delivered and how much actually incorporated in the work) depending upon the wording of the contract as to what percentage of the completed cost should be allowed the contractor at that date. The supervisor should not be too severe in scaling down the contractor's estimate unless he is convinced that the contractor is asking for more money than he is entitled to at that time. Arbitrarily cutting down the amount of the estimate below what the contractor is rightly entitled to forces the contractor to pad his estimate as a precaution against such an unjust course of action. When a contractor is engaged in carrying on numerous projects simultaneously, such a procedure on the part of the supervisor throws an unwarranted financial burden upon him.

In the case of work carried on under the cost-plus form of contract this application will be supported by copies of all pay-rolls and all paid invoices. These payrolls and invoices must all bear the approval of either the owner or architect before the contractor may submit them as supporting evidence.

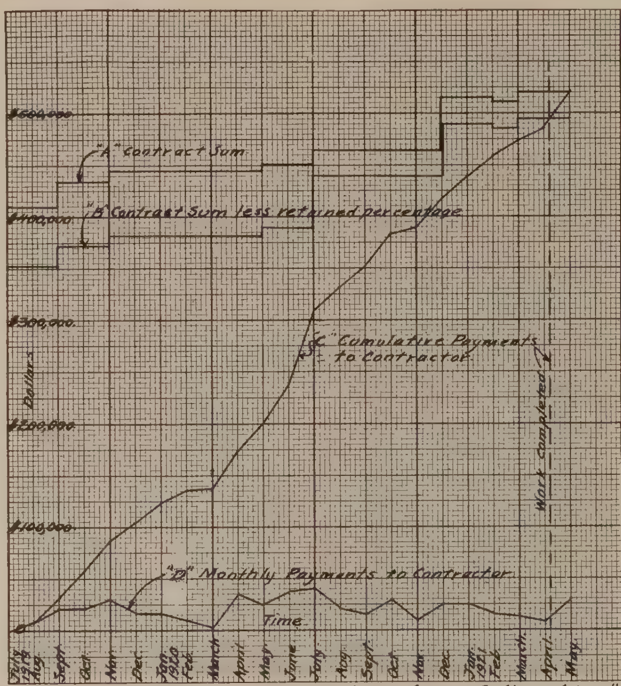


chart to accompany 'Building Supervision' refers to page 25 of manuscript.

A weekly meeting should be arranged for by the supervisor between the owner or his representative and the contractor, at which meetings various matters pertaining to the job may be discussed. In this manner the owner is kept in direct touch with the progress of the work and the contractor is kept constantly on the alert to present to the owner a satisfactory record of accomplishment. Completion dates, progress reports, reasons for delay, etc., are eligible for the docket of these meetings. A frank and candid discussion of these matters tends to remove the possibility of misunderstanding and leads to a helpful co-operation of all the interested parties, making it possible to continue the work under the most favorable conditions of harmony.

The supervisor should conduct as many of his transactions in writing as possible. Verbal instructions to the contractor, when given, should be immediately confirmed in writing and a permanent record kept of such orders. Written orders are, however, always preferable, as there is the incentive to be more explicit in a written instrument than in a verbal one. All outgoing correspondence should be in triplicate, one copy for his files and one for his home office. He should also receive copies of all letters to his home office relative to his work, as it is only in this manner that he may keep completely informed of the circumstances that bear upon his particular job. The resulting familiarity with the salient facts pertaining to his job enables the supervisor to direct his work with a greater degree of understanding than if he were compelled to proceed without this information.

A diary should be kept containing weather records, notes on the progress of the work, instructions given contractor, minutes of meetings, and other matters having a direct bearing on the progress of the work which may prove of interest and use in settling discussions which may arise later over any feature of the work.

A simple progress chart may be compiled showing in graphic form what progress has been made from month to month. This chart should show: *A*, Total contract figure; *B*, Contract figure less retained percentage; *C*, Cumulative payments to contractor, and, *D*, Monthly payments to contractor. Any convenient scale may be adopted with time as the abscissa and dollars as the ordinate. This chart, in addition to being of interest through the presentation of facts in a graphic manner, serves in conjunction with the contractor's completion programme as a means of establishing the probable date of completion. The intersection of curves *B* and *C* determines the approximate date at which the work may be completed. This date may be forecast by projecting these curves until they intersect, giving due weight to the circumstances existing on each individual job.

These various notes and documents should preferably be kept in loose-leaf form and should be typed wherever possible. The addition of a small portable typewriter, such as the Corona, to the supervisor's equipment is of great benefit in keeping an orderly record of the business he transacts.

The supervisor should be constantly on the alert to note the possibility of modification of design or methods that may serve to bring about an improvement in the finished structure. He may be able, from the advantageous position he occupies relative to the progress of the work, to suggest changes in the design or in the arrangement of space that have been entirely overlooked in the preparation of plans and specifications. Certain omissions may profitably be made that will result in a reduction in cost at the same time not affecting adversely the adaptability of the building for the purpose for which it was designed.

When it is inadvisable for the contractor to prepare a lump-sum estimate for extra work, these extras are frequently contracted for on a basis of the actual cost to the contractor plus a percentage for overhead and profit. Under such an arrangement it devolves upon the supervisor to check these figures to see that they are reasonable.

Where it is possible for the contractor to prepare beforehand a lump-sum estimate of the cost of extra work, the estimate should be itemized and submitted to the supervisor for his approval. The proposal should state explicitly what work is covered therein, as it frequently develops that changes are more far-reaching than at first suspected and the owner is called upon to approve additional extras that should have been included in the original.

The supervisor should always investigate personally any question that may arise that requires his decision. He should never be content to rely entirely on the word of another for a statement of existing conditions. He is far better able to reach a fair solution through a personal knowledge of the contributing factors.

The supervisor may be called upon from time to time to check and approve shop drawings submitted by various of the subcontractors. He will find it to his advantage to co-operate with the contractor's superintendent in checking these drawings, as they both have a common interest in seeing that all of the work fits as it should when the time comes to install it.

Much conflict in the installation of the equipment of the various trades may be forestalled or prevented by a careful survey of the situation by the supervisor. The equipment drawings are diagrammatic only, the final arrangements being left to the mechanics installing the equipment, and unless carefully supervised the available space is not always used to the best advantage for all concerned. The supervisor should see that electrical outlets in the ceiling are not screened by ventilating ducts, that pipes that might have been located elsewhere occupy the only available space for air-ducts, etc. Where possible and where it will not interfere with their successful operation, pipes and ducts should be concealed. These at best, when exposed, do not add to the appearance of a room, and no reasonable amount of effort should be spared to render them inconspicuous.

When the owner is called upon under the terms of the contract to furnish certain materials or equipment for the contractor to install, he should be duly notified by the supervisor as to when to make delivery of such materials in order to fit in with the completion schedule.

The specifications should detail the individual obligations of owner and contractor under such an arrangement, but it frequently becomes necessary for the supervisor to direct the incidental details.

In some cases progress photographs are specified. These are usually 8 inches by 10 inches in size, finished with a glossy surface and mounted ready for insertion in an album. The date and title should appear on the face of each print. These prints are very useful additions to the architect's records not only in regard to the carrying on of that particular operation but in subsequent alterations and additions. A well-chosen photograph will show details of construction and of method that might otherwise be forgotten or lost. They are also of invaluable assistance as evidence in case of litigation arising over any phase of the building operation.

The Bureau of Standards has developed a photographic method of recording progress that permits of a permanent record of changes occurring in work between any two successive dates. Two negatives are made of the structure on different dates from the same spot, including as nearly as possible the same view. A positive is made from one of these negatives, and this positive superimposed on the other negative and printed with it. Any changes made in the work between the two dates will show as dark or light patches against the uniform gray background of the resulting print.

The supervisor should insist that the contractor furnish sufficient artificial illumination in the basement and in other dark places during construction to permit of good workmanship. It will then be possible for the supervisor to make a proper inspection of such work and thus insure that the quality and finish of the work are maintained strictly in accordance with the requirements of the specifications.

The operation of concreting will claim much attention on the part of the supervisor. This work must of necessity be done correctly originally in order to avoid costly cutting and patching. The supervisor should note that the forms are clean and tight, that the steel reinforcing rods and stirrups are properly secured in the positions called for in the structural details, that old and new concrete is carefully joined to insure of a proper bond, that the concrete is composed of the proper proportions of acceptable ingredients properly mixed and deposited, and that all concrete is well spaded in order to eliminate all porosity.

The supervisor will be interested in the character of the brick work and should keep it under constant surveillance as it progresses. He should see that all walls are properly bonded in accordance with the City Building Code, that walls are plumb and true to line, that openings of the proper dimensions occur where called for on the plans, that bearing plates are well bedded, that chases are left where required by pipes or other equipment, that the inside of brick-lined flues are well plastered, that all joints are well filled with mortar, and in a general way that all masonry is built in a workmanlike manner.

Face brickwork requires considerable more attention, as the appearance of the finished wall is of relatively much more importance than is its strength. Courses should be horizontal with joints neatly made in order to avoid smearing the surface of the brick with excess mortar. The face brickwork should be well bonded into the backing with headers every sixth course or so or with some form of metal wall tie.

Some specifications admit of the addition of a small amount of hydrated lime to the cement mortar in order to render it more workable. The amount usually specified is small, about 15 per cent by weight of the cement being the average. There is a great temptation on the part of the mason foreman to exceed this amount for the sake of the added workability that results. Additions over the amount named serve only to weaken the strength of the mortar and it may become necessary for the supervisor, in order to discourage this practice, to refuse permission to add any lime at all to the mortar.

The quantity of the various ingredients of the mortar should be checked frequently in order to insure a mix in accordance with that specified. This also applies to the various ingredients of the concrete. The simplest manner of making this check is to count the number of wheelbarrow loads of each material that goes in to the mix, after previously determining the capacity of the barrow by filling it with a known amount of material.

The supervisor should carefully inspect the cut stone before it is placed in the wall in order to determine what defects, if any, exist. Granites are subject to seams and sap stains. Either of these defects is sufficient cause for rejection. Sandstones are subject to sand holes and variations in color, both of which defects should be carefully looked for. The supervisor should look for patches, which are sometimes made in piecing together broken pieces of stone in the hope of their escaping the attention of the supervisor. The supervisor should see that all stonework is securely anchored in order to prevent its becoming detached

from the finished structure. All stone work should be bedded on the grain, otherwise there is a tendency in stones of sedimentary origin for the stratification to spall off if placed with the grain vertical. The joints should be raked out to a depth of at least three-quarters of an inch. If this is not done the pointing-up mortar is apt to become loose and fall away.

The supervisor should prohibit the use of wood wedges in the erection of cut-stone work. These are very detrimental in their effect on the appearance of the finished work in that it is difficult to entirely remove them after the mortar has set. When located below grade they will, unless carefully removed and pointed up, eventually rot out, leaving holes through which serious leakage may develop. When exposed on the face of the wall alternate wetting and drying will cause them to swell, thus spalling off small particles of the stone face. Small chips of stone should always be used in place of the wooden wedges.

It will readily be appreciated that the supervisor plays an important part in the erection of a building or other structure and that much of the success of the enterprise depends upon the exercise of his experience and judgment.

Fortunately the average contractor has no other thought than to execute the work called for in his contract in a workmanlike and expeditious manner. It is more to his advantage to gain the good-will of the building public by a record of honesty and ability than to seek to make an undue profit by unfair and unscrupulous methods and thereby run the risk of becoming known as an unreliable contractor. This attitude on the part of the contractor greatly simplifies the problem of the supervisor in his dealings with him.

The supervisor should always keep in mind while reaching his decisions the thought that the finished structure is to endure for many years, and that mistakes that are allowed to creep into the work and remain permanent will remain as a record as long as the structure stands. If the effect of such deviation from plans and specifications on the part of the contractor exercises a negligible influence on the utility and the appearance of the finished structure and would prove costly of rectification, the supervisor may well decide to be lenient with the contractor and not require such corrections to be made. This decision should be subject to local considerations, the nature and location of the mistake, the integrity of the contractor, etc.

There should be no antagonism between the supervisor and superintendent, as both should realize that they are both working in a common cause and that the success of one depends, in no small manner, upon the close and hearty co-operation of the other.

It will readily be appreciated that the supervisor plays an important part in the erection of a building or other structure and that much of the success of the enterprise depends upon the exercise of his experience and judgment.

END.

Professor Phelps, of Cornell, to Be a Member of the Art Students' Tour Faculty

AMERICAN students of architecture will be interested in the opportunity offered to them by the Institute of International Education to study the development of architecture in Europe next summer under Professor Albert C. Phelps, professor of architecture in the College of Architecture, Cornell University. Professor Phelps will be a member of the faculty of the Art Students' Tour which has been organized for the summer of 1923 under the sponsorship of the institute; other members will be Miss Edith R. Abbot, of the Metropolitan Museum of Art, New York City, as a lecturer on the history and appreciation of painting and sculpture, Mr. John C. Tidden, of Rice Institute, Texas, as instructor in painting and lecturer on the fine arts from the standpoint of the creative artist, and others whose names will be announced later.

The group will sail from New York on June 30, 1923, on the Cunarder *Saxonia*. Professor Phelps will lecture during each day of the transatlantic voyage, as a means of sketching in the broader outlines of the development of architecture and of preparing for the more specific lectures during the land portion of the trip. His lectures on shipboard will be illustrated by stereopticon slides from the collection of the Cornell College of Architecture.

After landing at Cherbourg, the group will visit Paris and Versailles, Rome, Perugia, Assisi, Florence, Venice, Milan, Ghent and Bruges, Brussels and Antwerp, the Dutch cities of Amsterdam, Haarlem, and The Hague, and finally England. The return voyage will be by the *Saxonia*, due to arrive in New York September 4.

The Institute of International Education, under whose auspices the Art Students' Tour has been organized, has for many years been carrying on an important work characterized by such activities as exchange scholarships, exchange professorships, etc. During the last two years it has been extended to include also European travel for college students organized so as to permit students to travel more inexpensively, more conveniently, and with greater educational return, than they could do otherwise.

Complete information may be secured from the Institute of International Education or from Irwin Smith, 30 East 42d Street, New York City.

Announcements

The Arden Galleries, 599 Fifth Avenue, at 48th Street, announce a Garden and Country House Exhibition beginning April 10 and continuing until the 27th. The exhibitions at these galleries are always of especial interest to the profession as well as to the layman. Their recent showing of American Furniture, chiefly reproductions, attracted many visitors.

We take pleasure in acknowledging two attractive illustrated pamphlets from the Curtis Companies Service Bureau, Clinton, Iowa. "Better Built Homes" and "Keeping Down the Cost of Your Woodwork" are admirable examples of dignified and distinctive publicity. They should be welcomed in the architect's office.

The recently issued pamphlet illustrating Lipton Steel Windows for apartments, residences, basements, schools, hospitals, offices, garages, factories, etc., has reached our desk from David Lipton's Sons Co., Philadelphia. It should be on file in every architect's office.

Edward J. Weber, architect, announces the removal of his offices to 308 K. of C. Building, 237 Fourth Avenue, Pittsburgh, Pa. Manufacturers' samples, literature, and catalogues will be welcome.

The partnership of Bentob & Bengtson, Richmond, Va., has been dissolved and L. T. Bengtson is practising architecture independently at Room 510, Travelers Building, Richmond, Va.

The Cathedrals of Apulia

By P. C. Knowlton, B.S., M.Arch.

Holder of the Appleton Travelling Scholarship from Harvard University, 1920–1921

ARTICLE II

Fig. 13. Cathedral of Conversano. View from nave into transept.

WHAT, then, are the general characteristics of these churches? The Roman basilican plan was retained, a nave with single aisles as before mentioned in San Gregorio at Bari. The nave length varies, as may be seen from the respective plans. The plans shown here are reproduced at different scales — comparison, therefore, does not give the relative sizes of these cathedrals. In San Nicola at Bari and Bari cathedral the length is three times the width; in Ruvo and Trani the length is four times the width; in Troja three and a quarter times the width. The aisles are usually in square bays and vary in width according to the divisions in the nave arcade, which is usually treated in one of two ways: first, a simple division of the nave length into bays, as at Bari cathedral (Fig. 7), where there are nine bays separated by single columns. Second, a division of a pier with attached columns dividing the nave length into two groups of three bays each, as at Bitonto (Fig. 8). In general, the resulting aisle width is about one-half the nave width. At Ruvo it is much more than half, however. The exterior walls beyond the aisles are of tremendous thickness to take the thrust of the vaulting and were originally composed of great arcades with huge piers on line with the nave and aisle support. A thin curtain wall separated the aisles from these great external niches, but in most cases this curtain wall was at a later date moved out to the external face of the wall and chapels were installed on the inside opening off the aisle. Where entrance doors occurred the walls remain in their original position, *i.e.*, on the aisle face of the great wall. The thickness of this exterior wall or huge arcade varies. In some examples it is equal to one-half the aisle width. At Bitonto the total area in plan occupied by the wall with its chapels is equal to that occupied by the aisle itself. The position and thickness of this feature are expressed upon the front elevation, as we shall presently see.

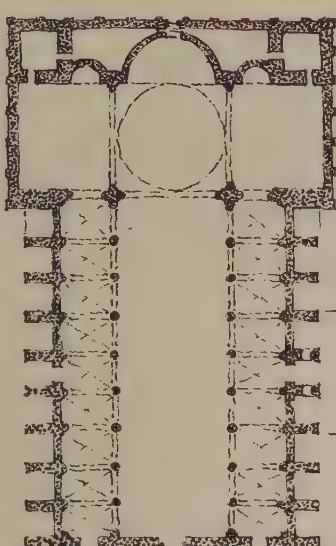


Fig. 7. Plan, Cathedral of Bari.

At the east end the nave and aisles open into a huge transept, in some cases as at Bari and San Nicola equal in width to the nave. In other cases as at Trani (Fig. 10), where it is one and one-half times the nave in width, or in Troja (Fig. 9), where it is one and one-third the nave width, there seems no relation. In Bari cathedral the fact that the crossing of nave and transept is vaulted would seem to indicate that at least where the equal relation exists, the idea was to have a domical covering at this point. In other cases, as at Conversano, there is no carrying through into the transept whatsoever of the lines of the nave arcade. At Bitonto the transept is undivided save for light pilasters which carry through the line of the nave arcade, and this is also true at Trani. The north and south walls of the transept or transepts (as perhaps we should term them when this great feature is divided) rarely project beyond the external wall of the main body of the church, which, it is to be remembered, is particularly wide due to the great external walls or arcades. The transept is usually triple apsed, the apses being either semicircular or segmental in shape and sometimes merely cut into the thickness of a very thick east wall. The central apse is much larger than the side ones; it is on the centre axis of the nave and sometimes corresponds in diameter with the arch between nave and transept. The smaller apses are usually, but not always, on the axes of the respective aisles. In general the east façade presents a flat line, the two corners being filled out with towers or the preparation for towers. In height the nave is usually about two and a quarter or two and a half times its width to the underside of the trusses, which were originally exposed, but in most cases, at present, are hidden by flat ceilings not of the original execution. The rose windows which usually occupy the gable ends are so high in the walls that the flat ceilings cut across them in a way that could hardly have been intended by the original builders. Some authorities believe that pilaster indications at Conversano signify an intention of vaulting the nave. Although the naves were wooden roofed, the aisles were vaulted with simple intersections, barrel vaults in general or slightly domical groin vaults. The ideal seems to have been to use the semicircular arch in all cases. The aisles are approximately twice their width in height and are lighted by small single light windows (Fig. 15). Over the aisles there is usually a low triforium gallery with a sloping wooden roof continuing sometimes out over the open gallery above the great external wall arches, but usually, as may be seen from the illustrations

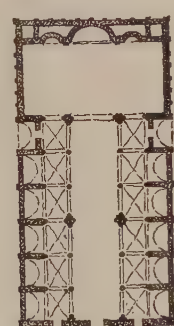


Fig. 8. Plan, Cathedral of Bitonto.

(Fig. 8), this external gallery has its own wooden roof following the pitch of that over the triforium. The clearstory is always low, usually showing on the outside above the top of the triforium roof about one-sixth the total height of the nave wall. It is lighted by small, round-headed windows sometimes placed quite at random without reference to the architecture below. The nave arcade composed of semicircular arches resting on columns varies in proportion from one and two-thirds to two and one-half times its diameter in height. Usually the nave wall space below the underside of the trusses is divided about half-way up the wall by a string course at the bottom of the triforium (Fig. 11). The triforium wall arch is about one-fifth the total height of the nave wall and encloses in most cases three semicircular small arches carried on columns. This wall arch is usually of about the same diameter as that of the nave arcade below. The nave is divided from the transept by a fine, high arch, sometimes slightly pointed. The transept is sometimes divided into three parts by arches that carry through the line of the nave arcade. The crossing thus formed at Bari cathedral is vaulted by a rather flat dome set on an octagonal lantern on squinches and lighted by tiny windows in the sides of this lantern (Fig. 12). The dome is roofed with a pyramidal wooden roof. In general, however, the entire transept was roofed like the nave with a wooden roof on exposed trusses, and was lighted at either end by a great rose window over two groups of windows of two openings each. The apses are vaulted with half domes or elliptical domical forms according to the plan of the apse (Fig. 13). The central apse is lighted by a rather high window treated on the exterior very elaborately, as it is usually flanked by columns which rest upon the backs of beasts in turn supported by corbels (Fig. 5, March No.). These columns carry very rich hoods, and the whole serves as the feature of the east façade. The transept is frequently raised above the level of the nave and has a crypt below it reached by stairways from the aisles. These crypts are features of the churches and are remarkable in the extreme with their forests of tiny columns and ingenious vaulting which present every variety of arch, ellipse, rib, groin, and dome. With the attempt to use always the semicircular arch the builders were faced with conditions, particularly under the apse, that required other forms. Their struggles are those of all Romanesque builders and need not be taken up here. Relics of saints or "the actual body" kept in these places made them objects of pilgrimage, and to-day one finds them hung with offerings and testimonials. The column capitals are varied and interesting.

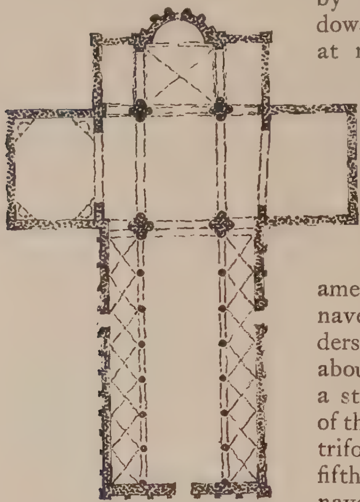


Fig. 9. Cathedral of Troja.

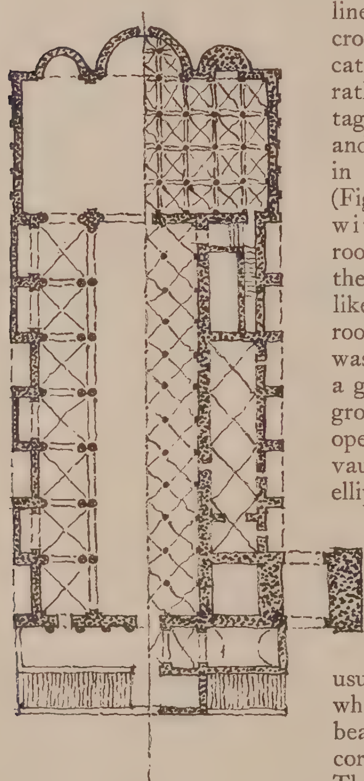


Fig. 10. Cathedral of Trani.

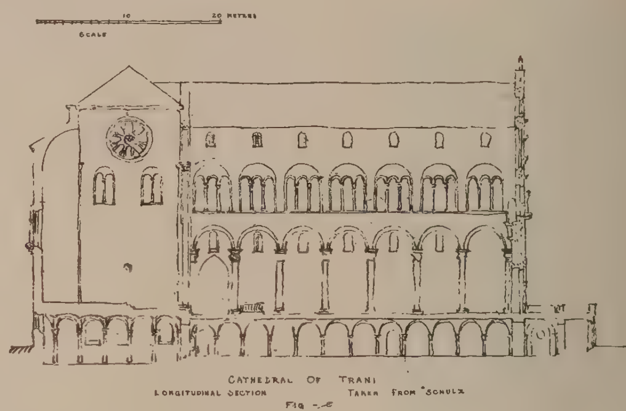


Fig. 11. Longitudinal section, Cathedral of Trani.

The west façade, usually very flat, is sometimes divided into three parts by pilasters recalling the nave division, and, instead of the rather squat big pediment across the whole of the church which is so common in the Romanesque examples of northern Italy, the southern churches have a gable over the nave, and have half gables over the aisles. The position of the open exterior gallery over the wall arcades is expressed by half gables, parallel to but not a straight continuation of the aisle gables (Fig. 14). The wall is finished in most cases by a strong corbel table, but there is no instance to my knowledge of the arcaded wall galleries so common in northern Italy. At Matera one finds in the gable of the nave the nearest approach to this feature in arcades on columns, but these are supported on corbels and are not galleries at all. In general the façades of the south depend for their effectiveness almost entirely on the spotting of the doorways and windows with the enrichment that surrounds them. The central doorway is usually made the important feature of this façade and is flanked by columns supported on beasts and carrying gorgeous hoods. Nowhere in Europe are there so many mag-

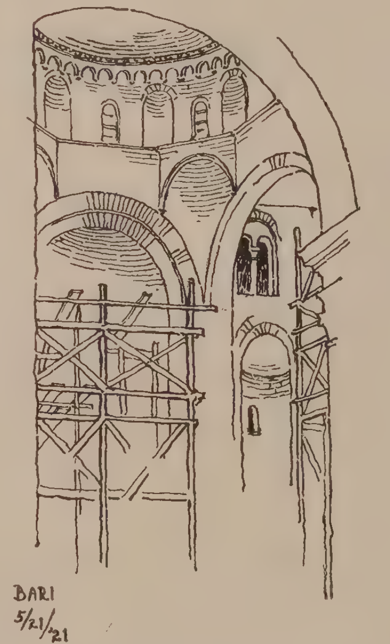


Fig. 12. Dome at crossing.

nificent examples of this sort of treatment both for doors and windows as in Apulia. One finds elephants used as the supporting beasts, a mysterious and foreign element that rouses many speculations as to its introduction. Above the great central door and sometimes above other windows one finds a great rose window rich in design and frequently under an elaborate hood. In some cases there are towers or the remains of towers built at the ends of the façade, but rather as prolongations of the façade than as an integral part of it. In some cases there are traces of great porches in one or more bays that existed on the west façade over the central door, or, as at Bitonto, stretching across the whole façade in three great bays. Sometimes similar porches were built on the north and south façades. Besides the great central door there are usually doors into the aisles smaller and less rich in treatment than the central door. Above each aisle door there is generally a two-light window enclosed in a semicircular arch and opening into the triforium gallery. Sometimes there are two similar groups opening into the nave above the central portal, and below a great rose window which occupies the nave gable.

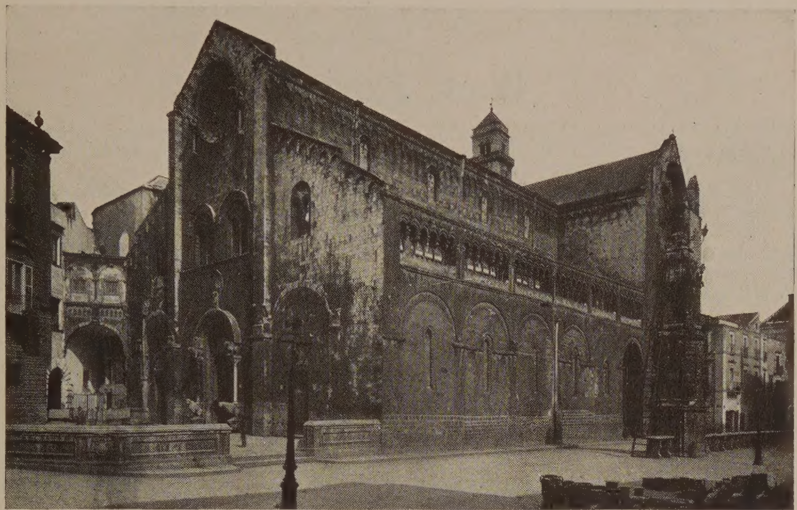


Fig. 14. Cathedral of Bitonto, general view.

Each side elevation presents a series of roofs—first, the one over the arcades; second, the one over the aisles and triforium, and then above the low clearstory the nave roof. One of the most interesting phases of these cathedrals is the exterior open side galleries along the top of the great aisle walls and corresponding to the triforium gallery over the aisles with which it connects. Sometimes, as at Bitonto (Figs. 14 and 16), this gallery is superbly rich and of a quality of design quite unique. The walls below, as has been said, are of tremendous thickness and are built in a series of great arches. At Bitonto and Altamura these arches have been filled up with chapels. At Trani only an occasional chapel has been inserted. The restoration at Bari (Fig. 15) removes the chapels completely. The original intention of these arches in the design seems to have been overlooked by the archæologists, some of whom insist on speaking of them as "a wall arcade of very flat projections on the flanks of the cathedral." Imagine the beauty of the delicate upper galleries above the great smashing shadows of these huge and simple wall arches—a combination I know of nowhere else. The arches recall those of the great buttressed walls of San Francesco at Assisi, but in the latter case the upper arcade is lacking. Note the interesting change of centres for the enframing arch on the external arcade (Figs. 14 and 15). This is a favorite practice of the Apulian builders, who seem to have been loath to employ both on the interior and exterior concentric circles. This treatment is repeated even in the corbel tables. The transept end appears as a gable with the aforementioned rose window and groups of two-light windows below. The transept is sometimes higher than the nave, and the wall is crowned by a more elaborate corbel table than that used on the nave wall. A blind arcade of shallow projections and composed of two semicircular arches enclosed in a third large arch is frequently used as a decoration upon the lower part of the transepts and is continued around and across the east façade.

Fig. 15. Cathedral of Bari, right flank.

The east façade presents, in general, a great blank wall surface out of which the two towers in the north and south corners were designed to rise, square, uncompromising, and grim, only being slightly relieved at the top by a corbel table above arched openings. The great apse window has already been mentioned.

Another type of church treatment on the lower façade occurs in some examples such as Troja and Monte San Angelo. A wall arcade of rather tall and thin proportions is carried across the façade or around the church: this arcade is

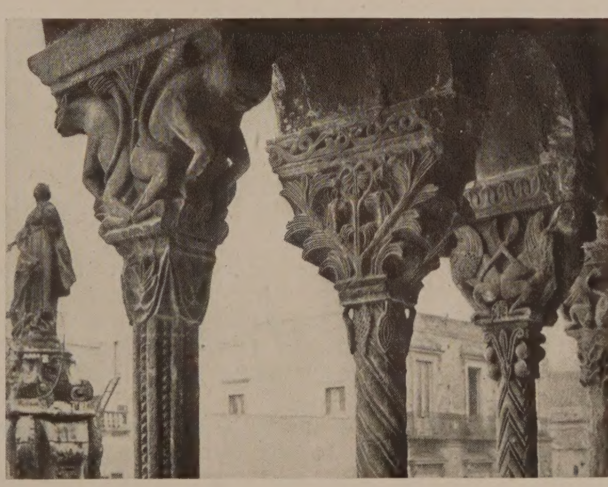


Fig. 16. Cathedral of Bitonto. Column caps in open exterior.

divided by piers almost square in plan and carrying rich pilaster caps. It is the type of treatment seen at Pisa Cathedral.

At Gravina, at Bisceglie, at Noicattaro, at Canossa—in almost every town in Apulia one finds some monument of interest and beauty—whether the jade and rose loveliness of Troja guarded by crumbling walls and fortified approaches against the lurking menace of wild mountains; the biscuit-tinted, sienna-splashed cathedral of Trani outlined against the open Adriatic; the proud and isolated Altamura, forgotten but dreaming on among the gentle apple-orchards which it seems to scorn; or if not a cathedral or church of importance, perhaps only a doorway of lacelike delicacy or a magnificent tomb—but always one finds something of sheer beauty to carry over living inspiration from that heritage of mediæval splendor.

Book Reviews

THE CONSTRUCTION OF THE SMALL HOUSE. A SIMPLE AND USEFUL SOURCE OF INFORMATION ON THE METHODS OF BUILDING SMALL AMERICAN HOMES FOR ANY ONE PLANNING TO BUILD. By H. Vandervoort Walsh, Instructor of Construction in the School of Architecture, Columbia University. With illustrations by the author. Charles Scribner's Sons, New York.

The title of Mr. Walsh's book clearly states his purpose in the writing of it, and he has carried out his plan with a knowledge of the things needed and with a completeness that should make the book a helpful reference for any one intending to build.

It is not a book of designs but a book pointing out the right and wrong ways of building in general. It might be called anatomy of sound construction and a guide to the building of the house comfortable, the house that will warrant the cost and repay the owner in endurance.

It is a safeguard against shoddy and a convincing argument for the need of the services of a competent architect in building even the simplest house.

CONCRETE CONSTRUCTION. By DeWitt Clinton Pond. A concise treatise on the design of reinforced-concrete slabs, beams, girders, columns, and footings, and a description of the actual design of a concrete building involving the use of flat-slab construction. Charles Scribner's Sons, New York.

Mr. Pond's "Engineering for Architects" is well known to the profession, and has been a text-book in various schools of architecture. In his new volume he has dealt with a subject of the greatest interest, and his conclusions are founded on his own actual experience in building some of the largest of modern concrete structures.

It is a practical book, needless to say (not one of theory only), and its text and many drawings make clear the best and accepted methods in the use of reinforced concrete.

Like his former volume, it should prove invaluable to those engaged in the construction of modern industrial buildings.

As the head of one of our leading Schools of Architecture says: "It shows a knowledge of the architectural aspects of the problem which is lacking in engineering books on the subject."

GOOD PRACTICE IN CONSTRUCTION. By Philip G. Knoblich. With a Preface by Thomas Hastings, F.A.I.A. The Pencil Points Press, New York.

This book of detail sheets selected and revised with great care makes what Mr. Hastings well says "a work of great usefulness in the drafting-rooms throughout the country and a valuable contribution to the practice of architecture."

The plates are admirably printed and the descriptive lettering clear and legible.

The material from which the plates were drawn came from the files of architects' drawings of actual buildings constructed and combining the methods of ten offices with special knowledge of men of long experience in one branch or another of the building industry.

VILLAS OF FLORENCE AND TUSCANY. By Harold Donaldson Eberlein. With frontispiece in color and 229 illustrations from photographs mostly taken by the author. J. B. Lippincott Co., Philadelphia.

There is no end to the fascination of the Italian villas, and many books have been written about them, especially about the larger ones whose charms have been described by many writers on art and architecture and published in sumptuous volumes that tempt the professional man and layman alike.

One might look at a hundred photographs of a more or less familiar villa and yet miss details that had never quite been seen as we see them ourselves. Looking at villas is much like looking at paintings, none see just the same way, and yet each finds beauty in them, beauty that no words can ever quite convey to the reader who has not seen for himself.

But now and then some one with a vision beyond the ordinary comes along and presents familiar villas with a freshness and charm that makes them a new joy and fills you with almost the sense of discovery.

Mr. Eberlein has of course given us a number of the big things, and presented them with completeness that convinces us that he brought to his work both the eye of the artist and the feeling of the poet. But he has given us, too, something more to be thankful for: a number of small and little-known villas that possess an interest quite as great as the show-places. There are delightful little bits that will make you stop and wonder why you did not take the time to go off the beaten track, wander among the out-of-the-way places, where so much loveliness is hidden all over Italy.

The text is an illuminating commentary on each villa, and together with the drawings of plots or plans helps to make the volume one of fresh and unusual value.

Mr. Eberlein has included photographs of many details that a less-observant and less-enthusiastic writer would have overlooked. It is in his knowledge of the architect's needs that he is able to make a book of more than ordinary charm and practical service.

The text gives a lucid and entertaining record of the evolution of the villa from the early defensive compact types to the more widely distributed elements that came with the days of a more settled civilization.

The towers that are such a familiar mark of most of them were the first structures built for defensive purposes.

There are interesting chapters on "Decoration and Furnishing" and on "Gardens Early and Late."

The book is one for architects and for every cultivated layman, who will find in the text and illustrations a source of pleasure and instruction.

THE AMERICAN HOUSE: Being a Collection of Illustrations and Plans of the Best Country and Suburban Houses Built in the United States During the Last Few Years. Edited by Charles S. Keefe, Architect. U. P. C. Book Co., 243 West 39th Street, New York.

This book contains a valuable collection of houses by architects of reputation, and the selections are admirable. It gives a fine impression of the high quality of our recent domestic architecture, and is a book for architect and layman alike, and should have wide distribution. The plates include Colonial houses—the dominating type—Georgian houses, Italian houses, French houses, English houses, interiors, doorways, and there are descriptive notes.

The variety of design and materials shown and the carefulness and good judgment with which the examples have been chosen make the book of exceptional value in the field it covers.

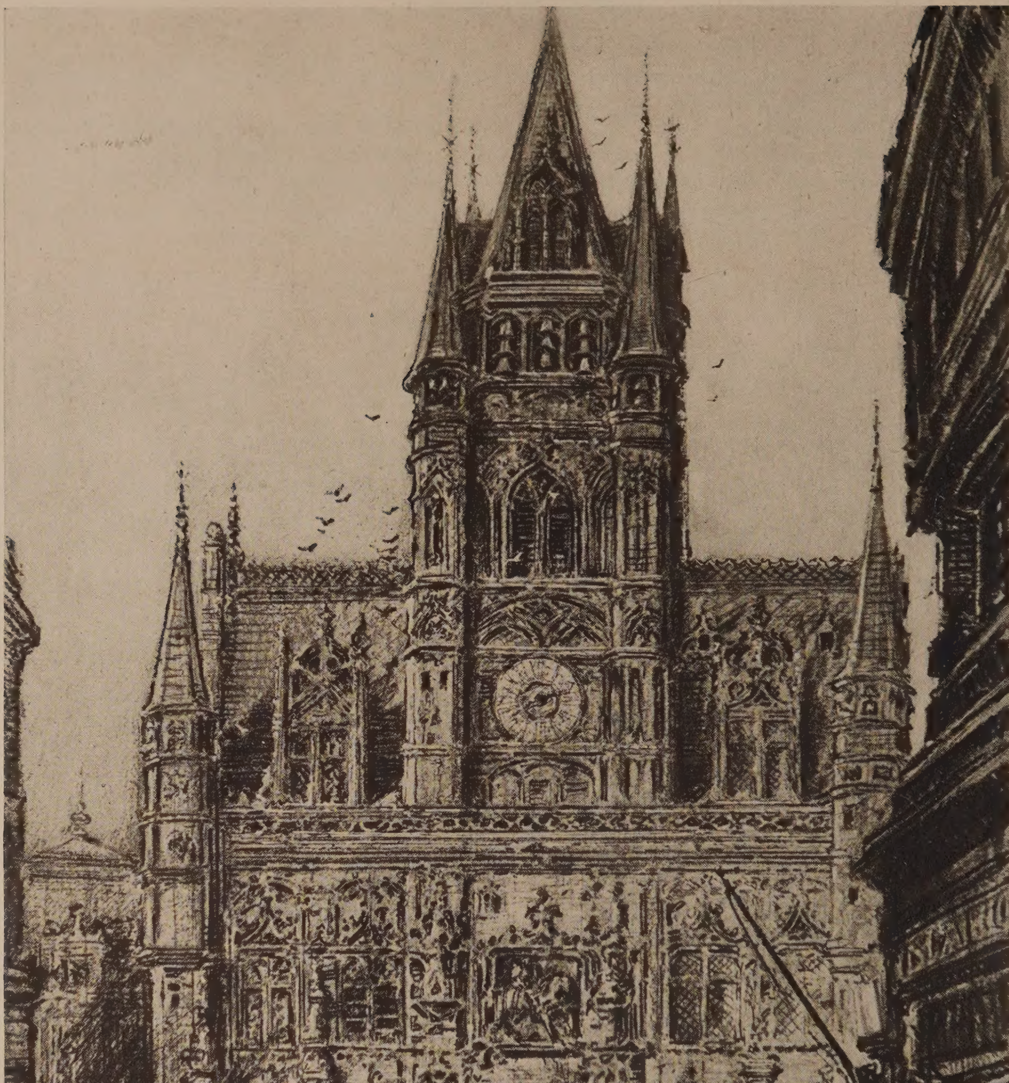
Among the architects represented are: John Russell Pope, W. Laurence Bottomley, Murphy & Dana, Dwight James Baum, Meller, Meigs & Howe, Lewis Colt Athe, Reginald, Johnson, Mygnon Hunt, and other well-known designers of especially attractive residences.

Chicago Architectural Exhibition

THE Chicago Architectural Exhibition, to be given jointly by the Chicago Architectural Club, the Illinois Society of Architects, and the Illinois Chapter, A. I. A., with the co-operation of the Art Institute of Chicago, will be held in the East Galleries of the Art Institute of Chicago, May 1 to May 31, 1923.

The exhibition will be illustrative of Architecture and the Allied Arts, and may include drawings and models of proposed or executed work, academic drawings, examples of rendering sketches, examples of decorative painting, sculpture, and the allied crafts, photographs and other features, specially arranged with the Exhibition Committee. Drawings must be framed or mounted and the *omission of glass* is requested. It is suggested, whenever possible, when rendered drawings are exhibited, that photographs of the completed work be exhibited with them. Exhibits otherwise desirable will not be rejected for the reason that they have been shown before.

The exhibition will be held in the fireproof galleries of the Art Institute, Michigan Boulevard, Chicago, opening Tuesday afternoon, May 1, and closing Thursday, May 31, 1923. The Art Institute will be open daily from 9 A.M. to 5.30 P.M.; Sunday, 12.15 P.M. to 10 P.M. Admission is free on Wednesday, Saturday, and Sunday; other days, 25 cents.



THE TOWN HALL AT COMPIÈGNE, FRANCE. DESTROYED IN 1915 BY THE GERMANS.

From the etching in color by George Wharton Edwards.